MYSORE GAZETTEER

HIS HIGHNESS
SIR SRI KRISHNARAJENDRA WADIYAR BAHADUR GCSI GBE
MAHARAJA OF MYSORE

MYSORE GAZETTEER

COMPILED FOR GOVERNMENT

VOLUME I

DESCRIPTIVE

EDITED BY

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NEW EDITION

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GENERAL PREFACE

THE idea of a *Gazetteer of Mysore*, projected as a work in eight volumes one for each of the present eight districts, first took shape in 1867 But owing to different causes, only two volumes, those relating to Mysore and Kolar compiled by Mr H Wellesley and Mr B Krishnamengar, C S I were issued A couple of years after the Census of 1871, Mr B Lewis Rice C I E then Director of Public Instruction in Mysore and Coorg, was charged with the task of compiling one work on a uniform plan The *Gazetteer* now took the form of two volumes, the first treating of Mysore in general and the second of Mysore by districts, eight in number This edition was issued in 1876 and attracted favourable notice The late Sir William Wilson Hunter, K C S I, the Editor of the *Imperial Gazetteer of India*, first and second editions, described them in an official report of 1877 as better than anything he himself had been able to do even for Bengal Twenty years later Mr Rice, still in the service of the State, was called upon to revise the work The revised edition was published in 1897 and soon won high appreciation It combined the result not only of much administrative

but also of the latest historical research, a field which in Mysore, Mr Rice had made peculiarly his own as Director of Archæological Researches and as the Editor of numerous classical Kannada works His retirement to England has deprived this edition of the benefit of his vast knowledge and well-known literary skill His interest in the work has, however, been keen and the historical notes sent by him have proved highly valuable

The second edition issued by Mr Rice having been out of print for some years, the Government of His Highness the Maharaja resolved that a new edition of the work should be published in connection with the Census of 1911 Orders were accordingly issued in July 1914 appointing Prāktana Vimarsa Vichakshana Rao Bahadur R. Narasimhachar, M A, then Director of Archæological Researches in Mysore, as its Compiler. He was later succeeded in that capacity by Mr V R Thyagaraja Iyer, M A, Director of Statistics, and subsequently Superintendent of Census Operations, Mysore State, during 1921 In February 1924. I was entrusted with the work and appointed Editor. The changes which have been effected in the administration of the State within the past thirty years have been such that it was deemed necessary by His Highness's Government that the new edition of the work should be so planned as to fully reflect them in it Agreeably to their

instructions, the bulk of the work has been raised from two to seven volumes, including a companion Atlas The single volume dealing with the State in general has now been expanded into four volumes entitled respectively 'Descriptive "Historical "' Economic' and 'Administrative Likewise in place of the previous single volume devoted to the eight districts, two volumes have been set apart for their description, one for the four Eastern and the other for the four Western districts Changes have been introduced not only in the general plan of the work but also in the methods of compiling the work in order to render it both comprehensive and up to date These changes would justify its being considered a new work rather than a new edition

The matter included in the several volumes has been read over by the various Departments of His Highness's Government and revised by them in the light of all the information available to them This has been especially the case in connection with the different chapters included in the volumes bearing on "Economic' and "Administrative. Some of the chapters forming the volume "Historical' have been submitted to the criticism of Rao Bahadur H Krishna Sastri, M A, late Epigraphist to the Government of India. For the great help he has rendered in connection with them, I would record my thanks here The late Rājakāryaprasakta B Ramakrishna Rao furnished

some valuable notes on the Post-Rendition period, while Dr. R. Shama Sastri, PH.D, the present Director of Archæological Researches in Mysore, has also been obligingly helpful in supplying copies of Departmental Reports whenever required. Several of the Chapters included in this volume have also been read through in manuscript by Messrs. R. Ranga Rao, B.A., B.L. and M. Venkatesa Iyengar, M A, to whom I am indebted for many valuable suggestions. Prāktana Vimarsa Vichakshana Rao Bahadur R. Narasimhachar, M.A, has assisted me by placing at my disposal reprints of his contributions to the Journals of certain learned Societies.

The general principle adopted in compiling the first volume of the work has been to entrust each chapter forming it to an authority capable of adequately dealing with its subject-matter either by special study or official experience. The following have helped in the preparation of the chapters noted against their names :—

CHAPTER II

Geology . .. B Jayaram, F G S, Director of Geology in Mysore

CHAPTER III.

Meteorology . . . C Seshachar, M A, F R MET SOC., Meteorological Reporter to the Government of Mysore

CHAPTER IV

Botany ..	G H Krumbiegel F.R.H.S. Superintendent of Botanical Gardens and Economic Botanist to the Government of Mysore Bangalore

CHAPTER V

Zoology	C R Narayana Rao M.A L.T Professor of Zoology Central College Bangalore

CHAPTER VII

Language	Prāktana Vimarsa Vichakshana Rao Bahadur R. Narasimhachar M.A

CHAPTER X

Public Health and Vital Statistics.	A K Pani L.R.C.P & S L.F.P & S D.P.H late Sanitary Commissioner in Mysore Bangalore

The rest of the chapters have been contributed by me in my capacity as Editor of the work, except that in writing the chapter on "Religion' valuable notes have been furnished by the late Rājasabhā bhūshana Rev A M Tabard, M.A., M.B.E., M.R.A.S., on the history of the Catholic Church in Mysore and by the Rev W H Thorp, B.A., and the Rev G Wilkins on the Protestant Missions in Mysore

Foot notes, which are the despair of the general reader, have been avoided Authorities, where

found necessary, have been cited in the body of the text Except in the "Historical" volume, these have been kept at a minimum Comparative statistics have been, as far as possible, given for the Census years 1881, 1901, 1911 and 1921. In some important cases the figures for 1871 have also been given. Every attempt has been made to incorporate the figures available up to 1923-24, and in certain cases even to the end of 1924-25. As far as possible all recent administrative changes have been included in the body of the work in the respective chapters In regard to the spelling of place-names and proper names, the ordinary spelling as approved by the Government of His Highness the Maharaja has been followed. Following the example of the *Imperial Gazetteer of India*, long vowels are indicated by the mark (–) in place of the accent (´) which has long since been obsolete.

A bibliography has been given at the end of each chapter, indicating the principal authorities relied on

In the preparation of the Index, care has been taken to see that it is fairly full and comprehensive, both in regard to subject matter and proper names. While cross-indexing has not been neglected, it has been kept strictly within limits

[illegible] (HAYAVADANA RAO,
[illegible] *Editor.*

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PUBLIC HEALTH AND VITAL STATISTICS

THE MYSORE GAZETTEER

VOLUME I

DESCRIPTIVE

CHAPTER I

PHYSICAL ASPECTS

Situation and area.

THE State of Mysore occupies a position physically well defined, in the South of India and has been termed a rocky triangle a not inapt description. It is a table land, situated in the angle where the Eastern and Western Ghat ranges converge into the group of the Nilgiri Hills. West, south and east therefore it is enclosed by chains of mountains, on whose shoulders the plateau which constitutes the country rests On the west, the boundary approaches at one part to within 10 miles of the sea, but in general preserves a distance of from 30 to 50 miles from the coast on the east the nearest point is not less than 120 miles. The southern extremity is 250 miles from Cape Comorin. The northern frontier is an exceedingly irregular line, ranging from 100 miles south of the river Krishna on the west to 150 on the east

The country extends between the parallels of 11°36′ and 15°2′ north latitude, and between the meridians of 74°40′ and 78°36′ east longitude embracing an area of 29 474 82 square miles including the area of the Civil and Military Station, Bangalore as determined by

the Surveyor-General of India from the survey on the one-inch scale It is, therefore, nearly equal to Scotland, whose area is 30,405 square miles The greatest length north and south is about 230 miles, east and west about 290

Boundaries

It is surrounded by the Madras Presidency on all sides, except on part of the west, where the Bombay Presidency northwards and Coorg southwards form the boundaries. The Madras Districts bordering on it are Bellary and Anantapur on the north, Cuddapah, North Arcot and Salem on the east, Coimbatore, Nilgiris and Malabar on the south, South Kanara on the west The Bombay Districts of Dharwar on the north and North Kanara on the west complete the circle Coorg intervenes between the adjacent parts of South Kanara and Malabar on the south-west

Elevation, etc

The general elevation rises from about 2,000 feet above the sea-level along the northern and southern frontiers to about 3,000 feet along the central water-parting, which separates the basin of the Krishna from that of the Cauvery and divides the country into two nearly equal parts But the surface is far from preserving the even character, suggested by the designation of table land For the face of the country is everywhere undulating, much broken up by lines of rocky hills or lofty mountains and scored in all parts by *nalas* or deep ravines There is probably not a square mile in the whole superficies absolutely flat or level, the slope of the ground ranging from 10 to 20 feet per mile in the more level portions, and as high as 60 to 80 feet elsewhere The Bhimesvar valley in the Sagar Taluk, Shimoga District, is probably the lowest point in Mysore with an elevation of only 278 feet, Mularagiri in the Bababudans in Kadur District with a height of 6,317 feet being the highest point

Hills and valleys.

The country is longitudinally intersected by single or aggregated chains of hills, running chiefly north and south, or in a direction nearly parallel to the two coasts. They lie at uncertain and unequal distances from each other and accordingly form sometimes wide and sometimes narrow valleys. Isolated peaks of *massy* rock termed by Europeans *droogs* (Sanskrit *dur-ga* difficult of access hill fort,) rearing their heads to 4 000 or 5 000 feet above the level of the sea stand forth like sentinels on every hand mostly crowned with the remains of fortifications whose position, with the advantage of an unfailing supply of water at the summit rendered them well nigh impregnable strongholds Besides these clusters or piles of naked rocks composed of immense rounded boulders are frequent large fragments being often delicately poised like loggans upon some projecting point appearing as if a touch would overturn them, and yet sometimes supporting a shrine or *mandapa*

Origin of name.

The name "Mysore is that of the capital Maisur, for Mahishur (from *mahisha* Sanskrit for buffalo reduced in Kanarese to *maisa*, and *uru* Kanarese for 'town or 'country) which commemorates the destruction of Mahishasura, a minotaur or buffalo-headed monster by Chamundi or Mahishasura Mardini the form under which the consort of Siva is worshipped as the tutelary goddess of the ruling family It forms the main part of the region called throughout Hindu literature Karnata or Karnataka a term now wrongly applied to the districts below the Eastern Ghats

Natural divisions

Mysore naturally divides itself into two separate regions each of which has well marked and distinctive features.

(*a*) *Malnad* —The Malnād literally hill country lies to the west and is confined to the tracts bordering or

resting on the Western Ghats. It is a land of magnificent hill and forest, presenting alterations of the most diversified and charming scenery A fertile soil and perennial streams clothe the valleys with verdant cultivation The sheltered hillsides are beautiful with waving woods, sometimes known as *Shōlas*, which give shade to numerous plantations of coffee Higher up are swelling downs and grassy slopes, dotted over with park-like groups of trees The *Kan* or evergreen forests, confined almost solely to the north-western parts of the Shimoga District, abound in rich soil and are exceedingly striking and distinctive in character and afford a striking contrast Above all, the gigantic mountains rear their towering crests in every fantastic form of peak Human dwellings are few and far between A cottage here and there, picturesquely situated on the rising ground bordering the rice-fields, and hidden amid plantations of areca, palm and plantain, marks the homestead of a farmer and his family Towns there are none, and villages of even a dozen houses are rare The incessant rain of the monsoon months confines the people to their own farms Hence each householder surrounds himself with all the needs, and succeeds in making himself to a great extent independent of the external world. The conditions of this isolated life are insupportable to immigrants from the plains

(*b*) *Maidan* —By far the greater portion of the State, or all to the east and north of a line from (say) Shikarpur to Periapatna, continued along the southern border to the Biligirirangan hills, belongs to the division of Maidan, *Bailshīme*, or open country Although much of the intermediate region partakes of the characteristics of both, the transition from the Malnād to the Maidan is in some places very marked Dense forests, which shut in the view on every hand, give place to wide-spreading plains the solitary farm to clustering villages and populous towns.

Man meets with man the roads are covered with traffic and the mind feels relief in the sympathy of numbers

The means of water supply and the prevailing cultivation give the character to the various parts of the open country The level plains of alluvial black soil as in the north growing cotton or millet the districts irrigated by channels drawn from rivers as in the south and west, displaying the bright hues of sugar-cane and rice fields the lands under tanks filled with gardens of coconut and areca palms the higher lying undulating tracts of red soil as in the east yielding ragi and the common associated crops the stony and wide-spreading pasture grounds, as in the central parts, covered with coarse grass and relieved by shady groves of trees. The aspect of the country changes with the seasons, and what in the dry and cold months when the fields are lying fallow appears a dreary and monotonous prospect speedily assumes under the first operations of the plough the grateful hues of tillage which, under the influence of seasonable rains give place in succession to the bright verdure of the tender blade, the universal green of the growing crops and the browner tints of the ripening grain The scene meanwhile is full of life with husbandmen, their families and cattle engaged in the labours of the field These are prolonged in stacking and threshing until the cold season again sets in and the country once more assumes a parched and dusty aspect

General aspect of the country

The drainage of the country, with a slight exception finds its way to the Bay of Bengal and is divisible into three great river systems that of the Tungabhadra on the north the Cauvery on the south the two Pennars and the Palar on the east The only streams flowing to the Arabian Sea are those of certain taluks in the north west which, uniting in the Sharavati, hurl themselves

River systems.

down the Ghats in the magnificent falls of Gersoppa; and some minor streams of Nagar and Manjarabad, which flow into the Gargita and the Netravati The course of each river will be found described in detail in another volume of this *Gazetteer*

shed A line drawn east from Ballarayan-durga to Nandidurga (Nandy-droog) and thence south to Anekal, with one from Devarayadurga north to Pavagada will indicate approximately the watershed separating the three main river-basins From the north of this ridge flow the Tunga and the Bhadra, rising in the Western Ghats and uniting in the Tungabhadra, which, with its tributary the Hagari or Vedavati, joins the Krishna beyond the limits of Mysore between Kurnool and Srisaila From the south of the line, the Hemavati (with its affluent the Yegachi), the Lokapavani, Shimsha and Arkavati flow into the Cauvery, which, rising in Coorg and taking a south-easterly course through the country, receives also on the right bank the Lakshmantirtha, the Gundal, the Kabbani and the Honnu Hole before quitting the territory From the east of the line, in the immediate neighbourhood of Nandidurga, spring three main streams, forming a system which Lassen has designated "die Tripotamie des Dekhans," namely, Pennar, the Uttara Pinakini or Northern Pennar (with its tributaries the Chitravati and Papaghni), which discharges into the sea at Nellore, Ponnaiyar, the Dakshina Pinakini or Southern Pennar (Tamil *Ponnar* or *Poun-ar* and Telugu *Pennar*), which ends its course at Cuddalore, and between them the Palar, whose mouth is at Sadras A continuation of the east and west line through Nandidurga to Sunnakal will mark the water-parting between the first and the other two, which, again, are divided by a line passing from Jangamkote to Bowringpet and the Betarayan hills

More accurately described, the axial line or "great divide" which forms as it were the backbone of the country starts from the north of Ballalrayandurga and runs east by north to near Aldur. Thence it makes a bend, first northwards up to the western extremity of the Bababadan range and then south east passing between Belur and Halebid, down to Sige Gudda in the north of the Hassan taluk. From this point it strikes across the map in an east north-east direction rounding the southern extremities of the Harnhalli and Hogalvadi hills up to near Koratagere, where it encounters the great meridional chain of mountains. Following the range south past Devarayadurge to near Dodbele it resumes an east-north-easterly course to Nandidurga and continues the same to the frontier near Sunnakal. Geographically it lies between the parallels of 13° 10′ and 13° 25′. The axial line

A line projected north from the west of Koratagere up through Pavagada to the frontier, and one south from Nandidurga by Bangalore to Anekal, mark pretty nearly the limits of the respective river basins in the transverse direction. This water parting falls between the meridians of 77° 10′ and 77° 30′. Limits of the river basins.

The basin of the Sharavati, which runs to Honavar on the Kanara coast occupies the west of the Shimoga District. It may be defined by a line drawn from Kodachadri south-east to Kavaledurga thence north-east by Humcha to Masarur and west-north west by Ananta pur and Ikkeri to Talguppa. The streams between Kodachadri Kavaledurga and the Agumbi ghat westwards run down to Coondapoor and those of western Manjarabad to Mangalore.

The following statement contains an estimate of the total length within the State of the main rivers with their principal tributaries and the total area of the Total length of the main rivers.

catchment basin under each river-system within the same limits —

River system	Total length of Rivers	Total area of Basins
	Miles	Square Miles
Tungabhadra	611	11,031
Cauvery	646	9,186
N Pennar	167	2,280
S Pennar	32	1,541
Palar	47	1,036
Sharavati and West Coast rivers	103	1,881

Navigation on the rivers.

Owing to either rocky or shallow beds, none of the Mysore rivers is navigable, but bamboo floats and occasionally dry timber floats are carried down the Tunga, the Bhadra, and the Kabbani in the rainy season when they are in floods and offer a smooth water surface free from projecting rocks and other obstacles Most of the streams are fordable during the dry months, or can be crossed by rude bridges formed of logs or stones thrown across from boulder to boulder. During floods, and when freshes come down, traffic over the streams is often suspended until the water subsides But throughout the rainy season they are generally crossed at the appointed ferries by rafts, basket boats, canoes, or ferry boats Men also sometimes get over supporting themselves on either earthen pots or dry gourds From the following statement in Buchanan, it appears that Haidar attempted to establish navigation on the Tunga —

"From Mangalore Haidar brought to Shimoga many carpenters, and built a number of lighters of about eight tons burthen They are strong and flat bottomed, but, as the greater part of them have been allowed to remain on the bank where they were built, I doubt not that they were found very useless The attempt is, however, no impeachment on the sagacity of Haidar, who, having been educated in a place remote from every kind of navigation, could have no idea of what boats could perform nor of what obstacles would prevent

their utility To attempt dragging anything up such a torrent as the Tunga would be vain but after having seen the boats and known that some of them have been actually navigated down the river I have no doubt of its being practicable to carry down floats and on these perhaps many bulky articles of commerce might be transported

Rafts and ferry boats

The *teppa* or raft is formed of bamboos lashed together, and merely affords an unsteady footing the water washing freely through The *harigolu* or coracle is a circular basket of stout wicker work composed of interlaced bamboo laths and covered with buffalo hides It is 8 or 10 feet in diameter, with sides 3 or 4 feet high Herodotus notices as one of the most remarkable things he had seen at Babylon boats of a construction so exactly similar that the description of one would precisely answer for the other with the single difference of substituting willow for bamboo These boats carried the produce of Armenia and the parts above Assyria down the Euphrates to Babylon and each boat along with its cargo carried a few asses for the purpose of conveying the returns by a shorter overland route Boats of the description noticed by Herodotus, although apparently unknown in Greece at that period were in after ages commonly used in Italy on the Po and in Britain in the time of Cæsar Boats of the same materials but of different shape were until recently used in South Wales and the north west of Ireland in the former country they were named *corracle* in the latter *corraigh* A smaller kind of *harigolu* which holds only two people is used for crossing some jungle streams The *doni* or canoe is a dug out or hollowed log pointed at the two ends The *sangda* (cf. *Suggada* of the *Periplus*) or regular ferry boat is formed of two canoes secured together with a platform or deck fastened upon them and has sides turning on hinges which let down, form a gangway for loading and unloading All these crafts are

propelled by a long bamboo pole, and are dependent for their course upon the currents But paddles are sometimes used with the canoes and with rafts when the water is too deep to reach the bottom with a bamboo

Irrigation from the rivers

Though useless for purposes of navigation, the main streams, especially the Cauvery and its tributaries, support an extensive system of irrigation by means of channels drawn from immense dams, called *anicuts* (Kanarese *ane katte*, dam, dyke or embankment), which retain the upper waters at a high level and permit only the overflow to pass down stream These works are of great antiquity, the large Talkad anicut, the lowest down on the Cauvery, having been constructed a thousand years ago, while the most recent, with a few exceptions, are not less than three centuries old "The dreams which revealed to favoured mortals the plans of these ingenious works," says Wilks, "have each their appropriate legend, which is related with reverence and received with implicit belief" The channels or *kalves* thence drawn, meander over the adjoining tracts of country on either bank, following all the sinuosities of the ground, the total length running being upwards of 1,190 miles The anicuts and channels will be found fully described under the respective rivers in another volume of this *Gazetteer*

Tank system

There are no natural lakes in Mysore, but the streams which gather from the hillsides and fertilize the valleys are, at every favourable point, embanked in such a manner as to form a series of chain of reservoirs, called tanks (Kanarese *Kere*), the outflow from one at a higher level supplying the next lower, and so on all down the course of the stream at a few miles apart These tanks, varying in size from small ponds to extensive lakes, are dispersed throughout the country to the number of

38 080 and to such an extent has this principle of storing water been followed that it would now require some ingenuity to discover a site suitable for a new one without interfering with the supply of those already in existence One of the largest tanks is Sulekere 40 miles in circumference Other large ones are the Ayyankere Madagakere Masur Madagakere Vyasa samudra Ramasagara Moti Talab etc of which accounts will be found elsewhere (see another volume of this *Gazetteer*) Among large irrigational works of recent construction are the Vanivilasa sagara in the Chitaldrug District and Krishnaraja sagara in the Mysore District formed by damming the Vedavati and the Cauvery, respectively

Spring heads (*Talparigis*)

Spring heads called *talparigis* form an important feature of the hydrography of the north-east They extend throughout the border regions situated east of a line drawn from Koratagere to Hiriyur and Molakalmuru In the southern parts of this tract the springs may be tapped in the sandy soils at short distances apart and the water rises close to the surface Northward the supply is not so plentiful In Pavagada a soft porous rock has to be cut through before reaching the water and in the taluks of the Chitaldrug District hard strata of rock have sometimes to be perforated When the water is obtained it is either conducted by narrow channels to the fields or a *kapile* well is constructed, from which the water is raised by bullocks

Mountain systems.

From the gigantic head and shoulders as it were of the lofty Nilgiri group which commands the southern frontier are stretched forth like two arms in a north west and north-east direction respectively the Western and Eastern Ghat ranges holding within their mighty embrace the mountain locked plateau of Mysore. The hills of this table land though rarely in continuously

connected chains, arrange themselves into systems crossing the country longitudinally, in directions more or less parallel with the Eastern and Western Ghats according to their proximity to one or the other, and attaining their greatest elevation between 18 and 13½ degrees of north latitude, along the north of the watershed line dividing the Tungabhadra and Cauvery river systems

The hill ranges of the table land

(*a*) The best defined of these, which may be styled the Closepet-Tumkur range, has a width of from 10 to 29 miles and runs between the meridians of 77 degrees and 77½ degrees from the Biligirirangan hills as their western limit, through Kankanhalli northwards up to Maddagiri, and on to the frontier by way of Pavagada and Nidigal

(*b*) Close to this on its eastern side are the minor ranges of Nandidroog and Ambajiduriga, the former commencing near the hill of that name, stretches northwards by Gudibanda to Penukonda and the latter passes close by the town of Kolar and Bagepalli.

(*c*) Between the Closepet-Tumkur range and the Western Ghats are a series of longitudinal hill ranges having considerable intervals sometimes between its component parts

Starting from near Mysore a long continuous chain of mostly smooth-looking hills, with a variable width of 2 to 14 miles, passes by Nagamangala and Chiknayakanhalli, and crossing the middle of the north of Kankuppa in a north-north-western direction

(*d*) Further west a similar medial chain, including the loop of the Bababudans, commences from near Chikmagalur and runs north by Ajjampur, Ubrani, Basavapatna, Honnali and Male-bennur, along the right bank of the Tungabhadra, to the frontier where it crosses that river

The Bababudan hills, having the shape of a horse-shoe, rise majestically like some Titanic bastion, as it were,

guarding the approaches to the Malnad or the highland region formed by the congeries of hills and mountains which intervene between the range and the Ghats on the west.

(*e*) Another well pronounced range lies to the west of this along the meridian of about 75½ degrees from Ballalrayandurga up to beyond Shikarpur passing by Koppa Shankaragudda and Knmsi and ultimately coalescing with the previous range to the north of Honnali

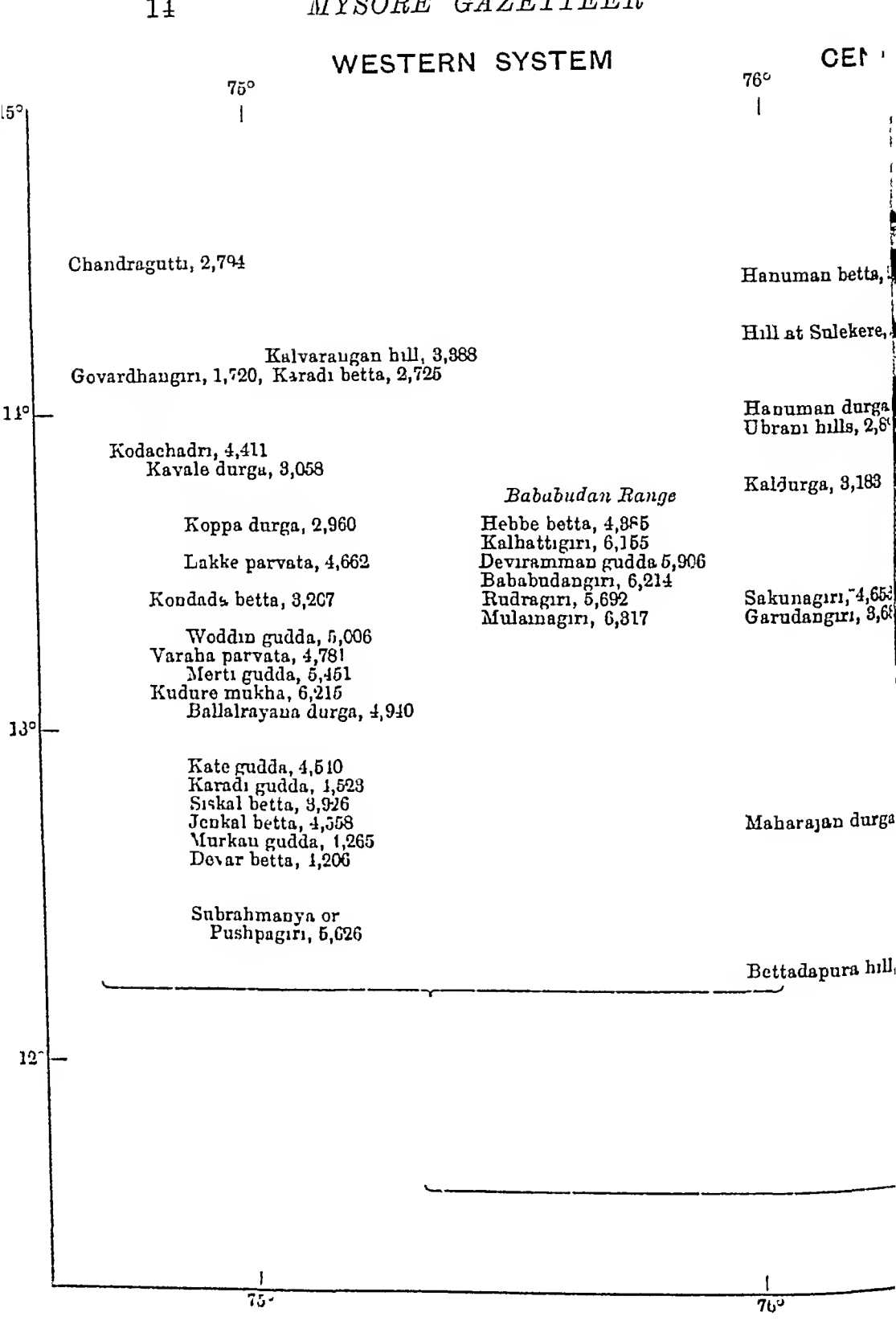
(*f*) Besides these in the table-land there are a few other minor chains of hills such as those of Hosdurga and Arsikere and some isolated hills like Chamundi Bettadpor betta and Gopalaswami betta in the south

General view of the Eastern and Western Ghat ranges.

Viewing the mountains as a whole the Eastern and Western Ghat ranges might be compared to the antlers of a stag the branching tynes being represented by the intermediate parallel chains starting from the north of the central watershed and more or less connected by cross ridges along their southern extremities. The chief peaks of the western system are loftier than those of the eastern. Except on the verge of the Western Ghats all the mountains throughout the country it is believed present their steepest escarpment more or less eastwards. In the west Mulainagiri and in the east, Nandidroog, are the highest elevations and they are almost on the same parallel or between 13° 23′ and 13° 24 immediately north of the central watershed The loftiest points just south of that line are Ballalrayandurga in the west, and Sivaganga in the east both situated between 13° 8′ and 13° 10′

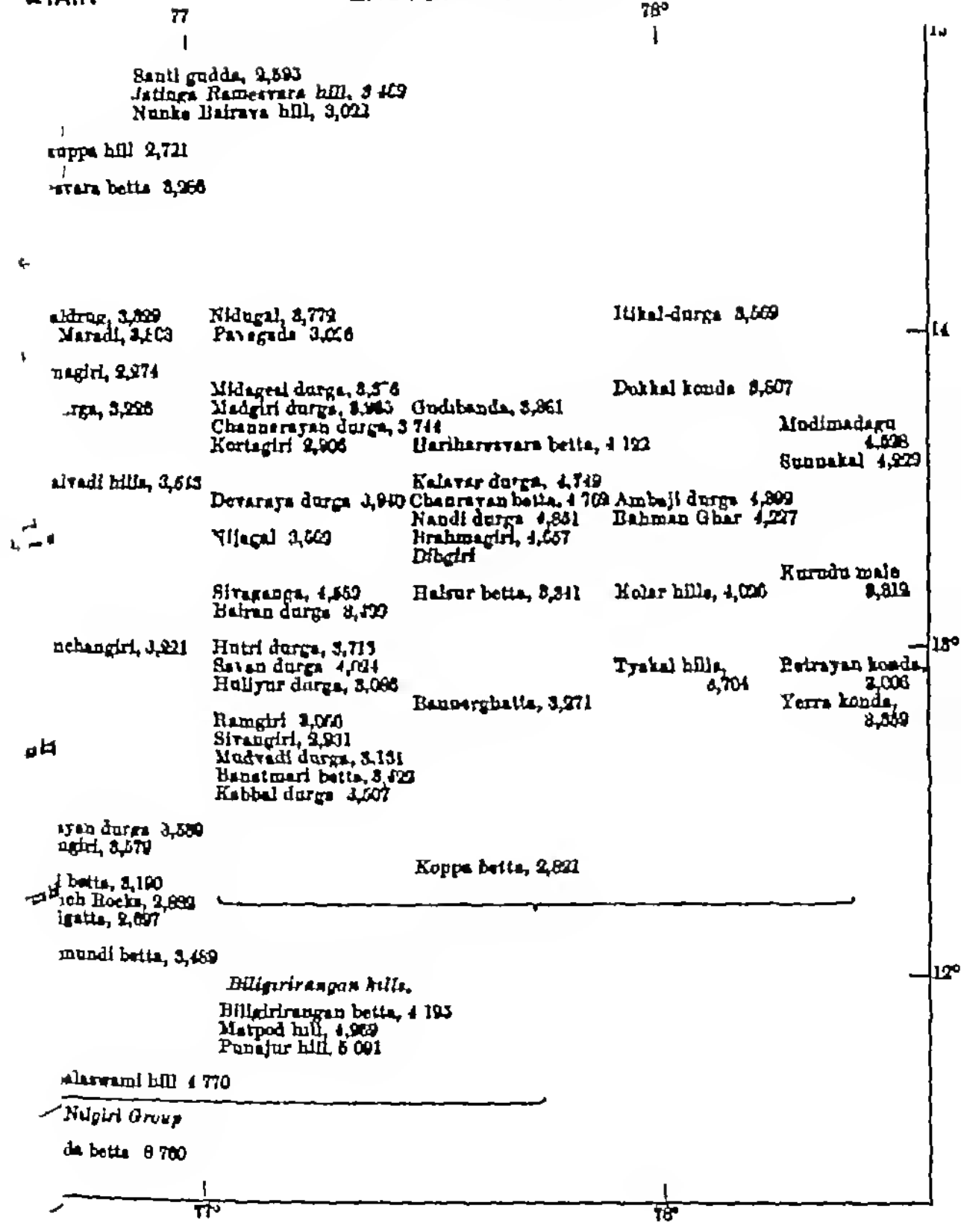
Table showing the heights of the peaks in the two systems.

The table on the following page will serve to show the arrangement and altitude of the principal peaks in each system. The figures are mostly taken from the charts


WESTERN SYSTEM
CEN
75°
76°
15°
Chandragutti, 2,794
Hanuman betta,
Hill at Sulekere,
Kalvarayan hill, 3,388
Govardhangiri, 1,720, Karadi betta, 2,725
11°
Hanuman durga
Ubrani hills, 2,6
Kodachadri, 4,411
Kavale durga, 3,058
Kalidurga, 3,183
Bababudan Range
Koppa durga, 2,960
Hebbe betta, 4,385
Kalhattigiri, 6,155
Lakke parvata, 4,662
Devirammau gudda 5,906
Bababudangiri, 6,214
Kondada betta, 3,207
Rudragiri, 5,692
Sakunagiri, 4,65
Mulainagiri, 6,317
Garudangiri, 3,6
Woddin gudda, 5,006
Varaha parvata, 4,781
Merti gudda, 5,451
Kudure mukha, 6,215
Ballalrayana durga, 4,940
13°
Kate gudda, 4,510
Karadi gudda, 4,523
Siskal betta, 3,926
Jenkal betta, 4,558
Maharajan durga
Murkan gudda, 1,265
Devar betta, 1,206
Subrahmanya or
Pushpagiri, 5,626
Bettadapura hill
12°
75°
76°

CHAIN

EASTERN SYSTEM



of the Great Trigonometrical Survey of India, supplemented from those of the Topographical Survey Furnished at the summit with springs which yield an unfailing supply of water, most of these heights seem formed by nature for secure retreats Hence there are few of the more prominent ones that have not been surrounded or capped with fortifications, often carried in long lines, with a vast expenditure of labour, along all the spurs and projections of the *droog*, forming strongholds with good reason deemed impregnable before the time when British artillery was directed against their walls A particular account of the most interesting fortifications will be found under each district

Opinion regarding the physical geography of Mysore

The following is Mr R D. Oldham's account regarding the physical geography of this part of India —

"In the peninsular area the mountains are all remnants of large table-lands, out of which the valleys and low lands have been carved The valleys, with a few local exceptions, are broad and open, the gradients of the rivers low, and the whole surface of the country presents the gently undulating aspect characteristic of an ancient land surface"

"The Anamalai, Palni and Travancore hills, south of the Palghat gap, and the Shevaroy and many other hill groups scattered over the Carnatic, may be remnants of a table-land once united to the Mysore plateau, but separated from it and from each other by ancient marine denudation Except the peculiar form of the hills, there is but little in favour of this view, but on the other hand there is nothing to indicate that the hill groups of the Carnatic and Travancore are areas of special elevation"

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CHAPTER II.

GEOLOGY

I Archæan Geology

Age of the geological formation of Mysore

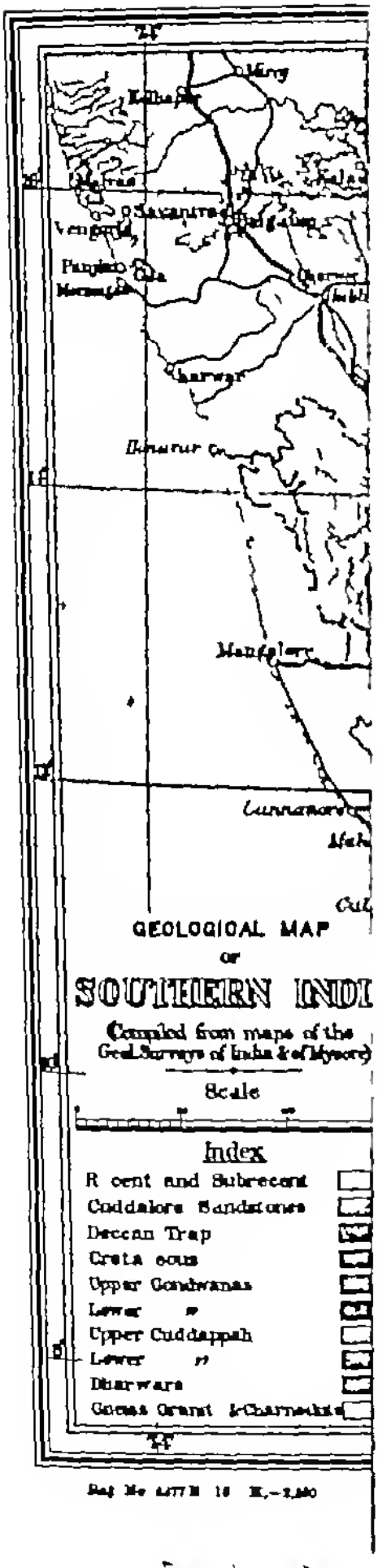
THE geological formation of Mysore is confined, almost entirely, to the most ancient epoch in the history of the earth's crust of which we have any visible and tangible record This epoch which is known as the Archæan Period, was long anterior to all the great sedimentary formations in which fossil records of the gradual evolution of plant and animal life have been preserved and which are so extensively developed in northern India and in other parts of the world

Order of succession and relative ages of the formations

The tabular statement given below shows the order of succession and relative ages of the formations composing the earth's crust amongst which the limited range of the rocks composing the Mysore plateau may be noted

The thickness shown for each formation is the maximum thickness of the sediments so far as known at present and the figures given here have been taken from the Presidential Address to the Geological Society of London, in 1909, by Professor W J. Sollas, LL D , D SC , F R S. The age or duration of the various periods is based on the assumption that the sediments have accumulated at the rate of one foot in a century, and although no great accuracy can be claimed for these estimates, they may be useful as affording some idea of the lapse of time covered by the Geological Record

No figures are given for the Archæan Period as the rocks have been so altered and disturbed that it is not always possible to distinguish between those of sedimen-


GEOLOGICAL MAP
OF
SOUTHERN INDI
Compiled from maps of the
Geol. Surveys of India & of Mysore
Scale
Index
Recent and Subrecent
Cuddalore Sandstones
Deccan Trap
Creta ceus
Upper Gondwanas
Lower "
Upper Cuddapah
Lower "
Dharwars
Gneiss Granit & Charnockite

tary and those of igneous origin nor to assign a definite order of succession or definite thickness to the sedimentary members. The period is considered to have been a long one and it has been suggested that the lapse of time represented by the Pre-Cambrian rocks (including the Archæan) may be equal to that from the base of the Cambrian to the present day—about 20 000 000 years according to the scale given In the remarks column a few of the salient points in the development of life forms have been noted opposite the formations in which the earliest fossil representatives have been found

Archæan character of Mysore rocks

The fact that the rocks of Mysore are confined to the Archæan and that the development of Land Plants and of the Indian coal measures took place many millions of years later explains why there is little hope of finding in Mysore those supplies of coal which are so badly needed for the industrial development of her mineral resources

Area of the Archæan rocks

The area of the Archæan rocks extends far beyond the boundaries of the Mysore State and occupies about 80 per cent of the whole of Southern India south of latitude 16°

The remainder of the area—chiefly along the coastal strips—is occupied by rocks of later age, and a brief account of the distribution and history of these later rocks will serve to emphasize the distinction between the geology of the Mysore plateau and that of the coastal regions of the peninsula

Map showing the distribution of rocks in Southern India.

The general distribution of the rocks of Southern India is shown in the special map included in another volume of this work This map has been compiled from maps prepared by the Geological Survey of India and from the records of the Mysore Geological Survey

TABLE OF FORMATION

Formations	Thickness Feet	Total years	Remarks
CAINOZOIC			
Recent and Pleistocene	4,000		Man
Pliocene	13,000		
Miocene	14,800		
Oligocene	12,000		
Eocene	20,000		Horses and larger mammals generally
Total	63,800	6,380,000	
MESOZOIC			
Upper Cretaceous	24,000		
Lower do	20,000		
Jurassic	8,000		Gigantic reptiles, birds and small mammals
Trias	17,000		
Total	69,000	18,280,000	
PALÆOZOIC			
Permian	12,000		Indian coal measures
Carboniferous	29,000		Reptiles
Devonian	22,000		Land Plants
Silurian	15,000		Fresh water and terrestrial invertebrates
Ordovician	17,000		Fishes
Cambrian	26,000		Marine invertebrates (many highly specialized)
Total	1,21,000	25,380,000	
PRE CAMBRIAN			
Keweenawan	50,000		
Animikean	14,000		Organic remains doubtful
Huronian	18,800		
Total	82,000	33,580,000	
(ARCHÆAN COMPLEX)			
Laurentian (intrusive)			Geology of Mysore practically confined to this period
Keewatin, etc	?		

II Post Archæan Geology of Southern India

The story of these rocks is fairly well known and has been very lucidly summarized by Sir Thomas Holland in the delightful chapter on the Geology of India in Volume I of the *Imperial Gazetteer of India*. At the close of the Archæan period Southern India formed part of an extensive land area composed of highly crushed and folded Archæan Rocks. An extremely long period of denudation followed during which these rocks were slowly worn down the upper covering of Dharwar schists being completely removed in places and the underlying gneisses and granites exposed. In places the sea encroached and permitted the accumulation of a great series of sediments which was subsequently raised to form land somewhat crumpled in the process. The remains of these sediments, composed largely of shales sandstones and limestones now form a patch about 14 000 square miles in area in the Cuddapah District—the total thickness being over 20 000 feet. The lower 20 000 feet which includes numerous basic lava flows and ferruginous jaspers is known as the Cuddapah Series and this is overlaid unconformably by the Kurnool Series (1 200 feet thick) which is notable chiefly for the occurrence of diamonds in some of the old sandstone and gravel beds at Banganapalle. All of these rocks are unfossiliferous and are regarded as of Pre Cambrian age and correlated with the Algonkian of North America.

The story of Post Archæan rocks

After the formation of the Kurnool series, there is an enormous blank in the geological history of Southern India extending over many millions of years during which interval the great Palæozoic sediments from the Cambrian to the Carboniferous were being accumulated in other parts of the world and in India, north of the Peninsula. Of these great formations, in which the

Blank in the geological history of Southern India.

earlier records of the evolution of life-forms are preserved, there is no trace in Southern India which appears to have formed an exceedingly stable buttress of the earth's crust, while other portions of the crust were continually in a state of flux, being alternately depressed below the sea and raised again into dry land many times

The close of the Carboniferous period

Towards the close of the Carboniferous period, there is evidence derived from the distribution of land fauna and flora that Southern India formed part of a great continental area extending to Africa and on to South America on the one side and on the other side possibly to Australia This old Continent, which has been called Gondwanaland, formed a barrier between a southern ocean and a great central Eurasian sea extending from Asia across Northern India, where the Himalayas now stand, into Europe and of which the Mediterranean is a small relic

Towards the close of the Carboniferous period the geological record is again taken up in Southern India Denudation had been slowly wearing down the old Archæan and Pre-Cambrian rocks and the larger rivers had gradually worn their valleys down to near their base level of erosion with gradual widening of the valleys and the development of slowly moving rivers and large swampy areas In these areas large tracts of fresh-water sediments were formed which included the debris of the luxurious vegetation of the coal measures The result was the accumulation of a considerable thickness of sediments, known as the Gondwana formation—from Permocarboniferous to Jurassic times—of which various small patches have been preserved along the eastern side of the Peninsula The lower portion of this formation constitutes the coal measures of India, and in the south the most important patches are those of the Godavari valley which include the Singareni coal field

The close of the Gondwana epoch.

At the close of the Gondwana epoch slight alterations in level permitted encroachments of the sea of which records are preserved in small but extremely interesting deposits at Trichinopoly Cuddalore and Pondicherry containing marine fossils of Cretaceous age After this the record is scanty and unessential and comprises a few beds of presumed Tertiary age in Travancore the Cuddalore Sandstones of the East Coast from Vizagapatam to Tinnevelly—of Pleistocene age—and the various recent blown sands alluvium and soils of the coastal strips

The end of the Cretaceous period.

As a contrast to this peaceful story it may be noted that towards the end of the Cretaceous period the old Gondwana continent began to break up and the land connection between Southern India and Africa disappeared under the sea. In the north of India a great series of movements began about the same time extending into the Tertiary period which resulted in the gradual rise of the Himalaya and the driving back of the central sea towards its present Mediterranean limits. These movements were accompanied by igneous action on a gigantic scale of which the most striking memento is to be found in the lava flows forming the Deccan Trap the remains of which form a horizontal layer covering an area of 200 000 square miles in Bombay Central India and Hyderabad

Summary

In Southern India therefore if we exclude the coastal strips we have an area which is formed almost entirely of the most ancient series of rocks of which any visible record exists, and this appears to have remained uncovered by any more recent formation—and almost without movement—during the whole of the vast period represented by the fossiliferous formations of other parts of the crust of the earth

With this very brief glance at the Post Archæan

geology of Southern India we may now turn back to consider the nature of the immensely old Archæan complex as exhibited in Mysore—which comprises an area of about 29,000 square miles—and in doing so we shall endeavour to take the components in the order of their formation, starting with the oldest

III The Dharwar System

The oldest rocks recognized in Mysore are the Dharwar schists which appear to possess a close resemblance to the Keewatin formation of North America In other parts of India certain gneisses and schists—such as the Bengal gneiss and the Khondalites of Vizianagaram—are considered to be older than the great mass of the Peninsular Gneiss and possibly of Pre-Dharwar age Clear evidence on the latter point is however lacking, and in Mysore no rocks older than the Dharwars have been recognized

members also appear to grade into rocks of recognizably igneous character

Igneous and other types of the Dharwar schists

Taken as a whole, the Dharwar rocks afford evidence of very extensive igneous action and many of the more schistose forms can be regarded as highly crushed and altered igneous rocks. Whether amongst the more schistose members there are rocks of sedimentary origin remains doubtful as clear evidence is wanting but it does not seem impossible that all of these rocks may have been derived from igneous material by metamorphic action.

Apart from the undoubtedly igneous types and these doubtful schistose types the system contains a number of other types, the physical and chemical characters of which cause them to stand out more prominently than their actual abundance would otherwise warrant These are conglomerates banded ferruginous quartzites quartzites and limestones all of which would usually be regarded as indicative of sedimentary action and if such action were admitted in the case of these associated types it would go far towards easing the way for accepting a sedimentary origin for many of the more obscure highly schistose rocks associated with them

Conglomerates.

The more closely the conglomerates of Mysore are studied the less probable does their sedimentary origin appear to become In many cases there is satisfactory evidence that they are crush conglomerates formed in shear zones in the schists or in one of the subsequent gneisses or in both Other cases which have not been closely studied may still be open to question but, on the whole evidence favours the view that their origin is autoclastic and not sedimentary

Banded ferruginous quartzites.

The problem of the banded ferruginous quartzites presents much greater difficulty owing largely to the fact

sub-aqueous to sub-aerial conditions. On the other hand if the series is not of sedimentary or chemical origin, it is extremely difficult to find a satisfactory explanation for it on account of the completeness of the metamorphism and the difficulty of finding good contacts It is not impossible that these banded rocks represent sills of highly ferruginous character subsequently altered to quartz and magnetite or even in some cases sills of a quartz magnetite rock such as will be referred to later in connection with the Charnockite series Whatever the origin of these rocks there can be little doubt that their banded character is largely secondary As to their sedimentary or aqueous character definite proof is lacking but the great consensus of opinion is in favour of such a view

We may now pass to the quartzites some of which are practically all quartz while some are felspathic and some micaceous. There is considerable doubt to what extent these can be regarded as the metamorphosed representatives of sedimentary sandstones There is a great variety of types and they appear to be of different ages Many of the beds originally mapped as quartzite have proved on close examination to be altered and silicified quartz porphyries some of which retain enough of the porphyritic character to be recognizable Others entirely quartzose are occasionally found to exhibit intrusive contacts with adjoining rocks while others of a later date penetrate the subsequent granitic gneiss and even pass from the gneiss into the schists. Quartzites.

There can be little doubt that many of these quartzites are brushed and re-crystallized quartz veins and quartz porphyries and possibly felsites and it is at least open to question whether we have any which are genuine sedimentary rocks.

Limestones

Finally, there are a number of beds or bands of limestone or dolomite which ordinarily would be regarded as of aqueous origin They are most numerous in the upper chloritic division, and it may be noted that a large number of the greenstone and chlorite-schist beds are characterized by an abundant development of calcite, dolomite, or ferro-dolomite not only in the doubtful schistose members, but also in those which are distinctly igneous In addition, some of the gneissic granite bands associated with the schists develop calcite which in places becomes extremely abundant By development of calcite, chiefly at the expense of the felspars, we get a series of rocks which approach limestone, and near by we have limestone bands sometimes very siliceous or chloritic and sometimes comparatively pure The association is suggestive, though it is not clear that a continuous series has been detected, and possibly the purer limestone bands have been concentrated along fissures or zones of weakness The proof that these beds have been so formed is naturally difficult, but there is much to suggest it.

Summary

To sum up, we have in the Dharwar system in Mysore a great series of lava-flows, sills, etc , and their crushed schistose representatives, associated with these are various doubtful schists which are more usually regarded as sedimentary, but which may possibly be igneous There are also a number of subordinate bands or layers of more distinctly sedimentary habit, such as conglomerates, banded ironstones, quartzites and limestones which are almost universally regarded as of sedimentary origin, but which are regarded in Mysore as probably formed from igneous material by metamorphic and metasomatic changes In some cases there is strong evidence for this, but conclusive proofs are difficult to find, and many more instances will be required before such a proposition can be stated in general terms

Ultra basic intrusives

Passing now from these components of the Dharwar system we come next to a series of rocks which may be classed as ultra basic. These consist of amphibolites —often in the form of actinolite or tremolite schists— amphibole-peridotites peridotites and dunites with their alteration products potstone serpentine and magnesite They appear to be sills dykes and intrusive bosses in the mass of the schists and are regarded as belonging to the Dharwar system on account of the evidence of their having been cut off and broken up by the subsequent intrusive gneiss. They are of importance for their mineral contents and contain considerable deposits of iron-ore, chrome-ore and magnesite It is very probable that the Chalk Hills of Salem which are conspicuous on account of the abundance of veins of white magnesite belong also to this series.

Other intrusives.

Finally we have some large intrusive masses of diabasic or dioritic character which appear to be later than many of the rocks already mentioned but prior to the gneiss and so regarded as of Dharwar age

At the close of the Dharwar age the whole of Southern India was covered with a mantle of these Dharwar rocks several thousand feet in thickness but successive intru sions of granite from below gradually penetrated or ate into the over lying mantle and this combined with fold ing and faulting caused the lower surface of the mantle in contact with the granites to become a very uneven one Subsequent denudation for many millions of years removed the greater portion of the mantle of Dharwars with the result that we now see the underlying granite and granitic gneisses exposed at the surface. The com paratively narrow strips of the Dharwar schists which still remain are but the deeper fragments of the one thick continuous layer

Distribution of the Schist Belts

The total area of the Dharwar schists in Mysore is nearly 5,000 square miles representing approximately one-sixth of the area of the whole State and is distributed mainly as follows —

(1) *Kolar Schist Belt*—This is situated near the eastern side of the State in the Kolar District It extends north and south for about 40 miles, with a maximum width of 4 miles, the total area being about 100 square miles

It is composed entirely of the dark hornblendic rocks of the *lower* division of the Dharwar schists with some banded ferruginous quartzites close to its eastern and western edges and some bands of amphibolite some of which are intrusive

The Kolar Gold Fields is contained within a length of 5 miles towards the southern end, and the workings have now gone a vertical depth of over 6,000 feet below surface

Indications of gold have been found further north at various points, but successful working has not yet been established

(2) *Chitaldrug Schist Belt*—This runs through the middle of the State with a N N W trend in the Chitaldrug District, where it has a maximum width of 25 miles, and passes southwards through the Tumkur and Mysore Districts in which it becomes split up into narrow bands finally disappearing a few miles south of Seringapatam The belt extends north of the State into the Bombay Presidency, the total length in Mysore being about 170 miles and the area nearly 2,000 square miles.

The main portion of the Belt is composed of chloritic schists of the *upper* division, but at the sides and in some of the narrower bands in the Mysore District there are considerable masses of the dark hornblendic schists Numerous bands of ferruginous quartzite occur throughout the belt and quartzites are abundant in places

Towards the western side in the Chitaldrug and Tumkur Districts are numerous bands of limestone—chiefly magnesian—and numerous bands and patches of iron and manganese ores. The iron ores are mostly soft hæmatites and limonites and the manganese ores are mostly highly ferruginous.

(3) *Hassan Schist Belt*—Sundry small bands and patches of the older hornblendic schists occur in the Hassan District and are noticeable chiefly for the number of sills dykes or intrusive masses of amphibolite and peridotite with which are associated iron and chrome ores and magnesite The better classes of chrome ore and magnesite occur further south in small patches of peridotite and dunite in the Mysore District

(4) *Shimoga Schist Belt*—This occupies a large part of the Kadur and Shimoga Districts and extends northwards through the Dharwar District of the Bombay Presidency In Mysore it is broken up into a number of large irregular patches separated by the later granites and gneisses, the total schist area being between 2 500 and 3,000 square miles The dark hornblendic schists occur chiefly along the Western Ghats and around the Bababudan hills while the areas around Ubrani Koppa, Kumsi and Shikarpur consist very largely of chlorite schists and greenstones with some mica schists

Quartzites of various kinds are abundant and very noticeable and numerous bands of magnesian limestone occur in the Ubrani Chitradrug and Kumsi schists. Banded ferruginous quartzites are abundant and large quantities of hæmatite and limonite occur along the eastern hills of the Bababudan chain Gold is widely distributed but the lenses or veins of ore though often rich are small and lack continuity and successful mining has not been established

Manganese ores are widely distributed in the chloritic schists but many of the deposits are small Some

of the deposits, however, are of considerable extent and some 300,000 tons of ore have been mined and exported already The ore is of fairly high quality and there are also very large quantities of more highly ferruginous ores which cannot be exported or utilized at present

(5) *Other Schists*—In addition to the above, small shreds, patches and fragments of the various schists—chiefly those of the lower hornblendic division—are widely scattered throughout the later intrusive gneisses and granites

IV Granites and Gneisses

Preliminary

With this brief notice of the Dharwar system, we may pass on to the subsequent granites and gneisses which now occupy by far the greater part of the whole area.

Champion gneiss

The earliest of these is a comparatively fine grained micaceous gneiss with bands and veins of coarser granite, pegmatite and quartz It is usually highly crushed and frequently contains zones of conglomerate composed not only of round to sub-angular fragments of the various granitic materials but also patches and lumps of the adjacent Dharwar rocks including the banded ferruginous quartzites. This gneiss was first recognized as a wide band near the eastern edge of the Kolar hornblendic schists into which it intrudes in tongues. Some distance south of the Mysore mine, the gneiss extends across the strike of the schists and then continues southwards near the western edge of the schist belt From south of the Mysore mines it sends some tongues northwards into the schists which are soon lost on surface, but some of them have been recognized in the deeper workings of the Mysore mine a mile or so to the north of the outcrops The gneiss is often characterized by the presence of grains or blebs of opalescent quartz, the

colour varying from a slight bluish milkiness to brown or dark grey, and has been referred to as *opalescent quartz gneiss* As a less cumbersome name and on account of its intimate and probably genetic connection with the auriferous veins of the Champion *lode* of the Kolar Gold Field it is proposed to call it, for the time being, the *Champion gneiss* Other patches of what is believed to be the same gneiss have been recognized more recently in the Shimoga Chitaldrug and Kadur Districts and several of these contain or form friction breccias or agglomerates which at one time were regarded as undoubtedly sedimentary conglomerates.

The Champion gneiss represents a very early period of granitic intrusion into the Dharwar schists Many of the highly crushed quartz porphyries or fine granite porphyries which have been alluded to as occurring in bands among the Dharwar schists also contain similar opalescent quartz blebs or phenocrysts and may very possibly be genetically connected with this early Champion gneiss It has been observed however that a considerable portion of the Dharwar schists in Mysore is composed of schistose rocks which are the derivatives of the Champion gneiss So the Dharwar system should be made to include the Champion gneiss as well

The remnants of the latter are not very extensive, and there is evidence of their having been intruded and cut off by the next succeeding formation which is the great gneissic complex of Mysore and probably of Southern India as a whole

Until recently this gneissic complex has usually been regarded as the oldest formation of Peninsular India and the term "fundamental which has been freely applied to it has usually carried with it the idea that it is the basement rock on which all the others—including the Dharwars—have been laid down Detailed work over the

greater portion of Mysore has shown that this is not the case and that this great gneissic complex is everywhere intrusive into the Dharwar schists and the Champion gneiss It seems desirable, therefore, to avoid the use of the word "fundamental" and as the complex is probably the most extensive formation of Peninsular India, it is proposed to call it the "*Peninsular gneiss*"

Peninsular gneiss

This Peninsular gneiss which underlies and intrudes the Dharwar system and the Champion gneiss is a complex of various granites, but so protean that no adequate description can be given here It is the most extensive and widely distributed rock in the State and is used largely for building and structural purposes The various granites, of which three are often distinctly recognizable, give evidence of successive intrusion and the fact that the earlier forms contain their own pegmatites, which are truncated by subsequent forms, points to a long continued period of plutonic activity Frequently, the various members mingle either by repeated injunction or absorption or crushing and shearing, and we get zones or areas which are highly banded or crushed or with complex flow structure Other portions are more homogeneous and appear as granite masses Amongst these latter are some which may be definitely later in age than the gneiss as a whole, but it is often difficult to decide one way or the other

Evidence of the intrusion of the Peninsular gneiss into the Dharwar schists is abundant and the former bristles, to a variable extent, with lenses, patches, and fragments of the Dharwars chiefly, as might be expected, belonging to the lower or hornblendic division

It would occupy too much space to enter into any account of the evidences of intrusion or of the contact metamorphism of the schists, and we may pass on to the next formation succeeding the Peninsular gneiss

The next formation is itself highly complex but, thanks to the labours of Sir Thomas Holland it can be recorded and summarily dismissed with the name Charnockite It is a huge plutonic complex characterized chiefly by the presence of hypersthene in which the alternating bands, frequently steeply inclined vary from an acid hypersthene-granite through various intermediate forms to hypersthene norites and hypersthenites These rocks form the great mass of the Nilgiris to the south of Mysore and come into Mysore on its eastern southern and western borders where they are found distinctly penetrating the Peninsular gneiss both as tongues and as basic dykes. An interesting addition to the series has been identified in Mysore in the form of dykes or narrow intrusive tongues of quartz-magnetite ore Gradational forms have been found in which the proportions of magnetite and quartz gradually increase with corresponding elimination of felspar hypersthene and amphibole until we get to a rock containing 50 per cent of magnetite, the remainder being quartz with subsidiary amounts of hypersthene and garnet Charnockite

The last formation of any considerable magnitude is the Closepet granite It occurs as a band about 20 miles in width running right through the State in a north and south direction from the southern boundary on the Cauvery river near Sivasamudram to Molakal muru in the extreme north of Chitaldrug, a distance of over 200 miles Doubtless it extends much further both north and south into British territory Topographically it is usually striking as it forms a great chain of rounded bosses or domes many of which are bare rock and form conspicuous features amongst which may be mentioned the Closepet Hills Magadi Shivaganga Devarayadurga, and the continuation of the chain northwards through the Tumkur and Chitaldrug Districts. Like most of the Closepet Granite.

plutonics of Southern India it also is complex and is composed of a mixture of red and grey granites, sometimes coarse, sometimes porphyritic, and sometimes so intermingled or deformed as to become gneiss It intrudes all the previously mentioned formations including the Charnockite It is probable that other isolated masses in Mysore—for instance, Chamundi Hill and the Arsikere and Banavar masses—may belong to the same age, and it is possible that the ornamental porphyry dykes of Seringapatam may be phases of this intrusion

This completes the distinct members of the Archæan complex which have been definitely recognized in Mysore,—with the exception of various hornblendic and other basic dykes which need not be referred to here

Dykes

Subsequent to the formation and folding of the Archæan complex, the whole country has been traversed by a series of basic dykes —chiefly dolerites—which from their freshness and the absence of deformation are regarded as post-Archæan, and it has been suggested that they may be of Cuddapah (Anmikean) age

Laterite

The only other rock formation in Mysore is laterite which is of comparatively recent (possibly Tertiary) formation and forms a horizontal capping on the upturned edges of the much denuded Archæans There is little doubt that it is mainly an alteration product of the underlying rocks, but the subject is too complex and variable to permit of further reference to it here

Tabular view of Mysore rocks

The foregoing sequence of events in the history of the rocks of the Mysore plateau may be exhibited in the following tabular statement —

Possibly Tertiary	1	Recent soils and gravels
	2	Laterite Horizontal sheet capping Archæans
Pre Cambrian (Anmikean)	3	Basic Dykes Chiefly various Dolerites

		Great Eparchæan Interval	
ARCHÆAN		4. Felsite and Porphyry dykes.	
		5. Closepet Granite and other masses of corresponding age	
		6. Charnockite Norite and Pyroxenite dykes	
		7. Charnockite masses.	
		8. Various hornblendic and pyroxenic granulite dykes	
		9. Peninsular gneiss (Granite and gneiss in complex	
		Eruptive Unconformity	
	10. Champion gneiss ...	Granite porphyry micaceous gneisses, felsites and quartz porphyries usually containing crystals of quartz and frequently associated with autoclastic conglomerates.	
	11. Upper (chloritic) division (Green stones and chlorite schists.)	Including also —	
		Amphibolites, peridotites etc. mostly intrusive	
		Conglomerates (autoclastic)	
		Banded ferruginous quartzites; origin doubtful, possibly igneous.	
		Quartzites and quartz schists mostly intrusive.	
DHARWAR SYSTEM (PROBABLY KELWATIN)	12. Lower (hornblendic) division. (Epidiorites and hornblendic schists). (Unknown.)	Limestones probably secondary	
		Mica schists; metamorphic igneous.	
		Intrusive masses of dioritic and diabasic character	

V *Earthquakes*

Their occurrence in the State.

Dr Heyden has remarked that the observations of Indian earthquakes recorded during the past nine years combined with the past seismological history of India confirm the conclusion that the Peninsula is remarkably stable Earthquakes tend generally to be more frequent in the regions of Extra peninsular India where the rocks have been recently folded than in Southern India Destructive earthquakes of the kind which have recently occurred in Assam (1897) and in the Kangra Valley in the Punjab Himalayas (1905) are altogether unknown in the State. The few that have occurred in it have been of the harmless type. From an inscription at Nolamangala it appears that an earthquake occurred there in July 1507 I felt one at Tumkur, writes Dr Benjamin Heyne 'on the 23rd of October 1800 It is remarkable that at the same time a violent hurricane

raged along the coast from Ongole to Masulipatam. The shock was felt at Bangalore and in most other parts of Mysore, and it was stronger in the south than where I was It seemed to come from the north, proceeding southward along the inland range of hills, and to be guided farther by those of which Sivaganga and Savandurga are the most conspicuous" Another earthquake was felt at Tumkur in 1865 Colonel Welsh says with reference to a shock that was experienced at Bangalore in 1813 :—"On the 29th of December (1813), we experienced a pretty smart shock of an earthquake, which was very general in its effects all over the cantonment, it was accompanied by a rumbling noise, like a gun-carriage going over a drawbridge, and appeared to come from the westward Our roof cracked as if a heavy stone had been thrown upon it, and every part of the house shook for some seconds Some older and weaker buildings were actually shaken down, and the walls of others separated or opened out" Several shocks were felt at Bangalore on the 31st of December, 1881, at about 7 A M. There was also an earthquake at Bangalore on the 13th April 1882 at 9-30 P M In recent years, a sharp shock was felt in Bangalore on the 8th February 1900, in the early hours of the morning, at about 3 hours 10 minutes, Madras time. A sort of rumbling sound was heard and it appeared to proceed from south to north Houses actually shook for a few seconds, causing considerable alarm to the inmates, many of whom ran out into the streets fearing danger. Another slight shock was recorded in the Bangalore Observatory at 3-13 P M, Madras time, on the 17th December 1913

VI Aerolites

Recorded instances with details

Aerolites or meteoric stones sometimes fall On the 21st of September 1865, at about 7 A M one weighing

11½ lbs. fell in a field near Maddur in the Mysore District. About half a mile from the spot where it fell, in another field, another stone fell at about the same time This was found broken into several pieces. It would appear from the report submitted on this fall that the stones, in both cases, had fallen slantingly from towards the north and not perpendicularly Just before the fall occurred, a report "just as if a cannon had been fired three times had been heard in the neighbourhood Also, at the time of the *fall* the sky was reported to have been clear with no clouds on it but, it was added, dew had fallen in the previous night A cultivator who was some 200 yards from where the first stone fell declared that immediately it fell his eyes were closed up from the rush of the smoky dust which had risen from the earth directly after the fall of the stone. The first of these stones is deposited in the Museum at Bangalore Another stone (a fragment) which fell at Chetnahalli near Challakere in the Chitaldrug District at 10 10 P M., on the 6th of September 1890 is also in the same Museum Nothing is known about the chemical composition of these stones.

It may be noted however that of every 1 000 meteors as shown by the observations of Denning about 30 will be as bright or brighter than Jupiter and would be called fire-balls Professor H. W Pickering notes in his *Popular Astronomy* that four of these 30 will move appreciably slower than the others while a very minute proportion of the four reaching the Earth s surface, will be found as stony meteorites The remaining 996 move in cometary orbits with high velocities and are not likely to reach the Earth s surface, the occasional one that does so being found to consist mainly of iron and nickel. Statistics indicate that 32 stony meteorites are seen to fall to one of these iron ones Of the stony ones perhaps, 10 per cent contain iron in appreciable quantities, and the

remainder are composed mainly of silica combined with magnesium, aluminium and calcium They arrive in excess in May and June, being otherwise quite uniformly distributed throughout the year The cometary meteors, on the other hand, arrive chiefly from July to November inclusive, when the orbits of Jupiter's comets approach most closely The stony meteorites fall most frequently between 4 and 5 P M , cometary meteors are most abundant after midnight Seeing that both the falls recorded in the State were in September—*viz* , between July and November as noted by Professor Pickering—the meteors that fell here must be reckoned to be cometary meteors The time of their fall—one fell at 7 A M and the other at 10-10 P M —seems confirmatory of this view.

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CHAPTER III.

METEOROLOGY

Introductory

THE details given in this chapter are based on observations taken since 1893, the year in which the Mysore Meteorological Department was formed, at the four observatories whose geographic co-ordinates and elevations are given in the following table —

Observatory	North latitude	East longitude	Height above mean sea-level
Bangalore	12° - 58′	77° - 36′	3,021 feet
Hassan	13° - 0′	76° - 10′	3,149 ,,
Mysore	12° - 18′	76° - 42′	2,518 ,,
Chitaldrug	14° - 14′	76° - 27′	2,405 ,,

The four observatories are situated at approximately the four corners of the State At present, observations of pressure, temperature, wind velocity and direction, cloud amount and rainfall are taken at 8 hours (local time) only at all the observatories except at Bangalore where observations are taken practically throughout the day. Records of observations taken at 10 hours and 16 hours (local time) at the other observatories are also available for some years Besides these observatories, there are 226 rain-gauges (one for about 130 square miles) distributed over all the taluk headquarters and important villages—the largest number for all the Indian States It is in the fitness of things that this should be so, seeing that the country is chiefly agricultural in character

The year may be roughly divided into four periods, each having its characteristic weather viz —

(1) the South West Monsoon period
(2) the retreating South West Monsoon period or the North East Monsoon period
(3) the Cold Weather period and
(4) the Hot Weather period

The South West Monsoon bursts at the end of May or early in June and lasts about 4 months During this period are the skies heavily clouded and a steady westerly wind blows over the State and the rainfall in the *malnad* regions is continuous and heavy The retreat of the South West Monsoon commences early in October and heavy rain falls in the eastern parts of the State in a normal year The wind velocity diminishes considerably and the direction from which the wind blows gradually shifts to the East The North East Monsoon period rarely extends to December The temperature is comparatively low from about the middle of December to the close of February and the skies quite clear except for the thin Cirrus clouds. The hot weather sets in early in March and increases in intensity to the end of May with occasional relief from thunderstorms

The close of the rainy season in November is marked by dense fogs which prevail all over the country during December and January They begin about three in the morning and last till seven when they are dispersed by the heat of the sun But in some parts fogs, or rather mists follow the earlier rains Thus about Chitaldrug from about August to October, the hills are obscured till nearly ten in the forenoon

Though the State is situated in the tropical zone the climate is equable as the elevation of the major portion of the State is over 2,400 feet and no part of the State Temperature.

is far distant from the sea The mean temperature for the warmest part of the country during the hottest month is less than 85° All the observatories have occasionally recorded temperatures over 100° but the thermometer has not risen over 100° on 2 or 3 consecutive days except at Chitaldrug, where the maximum temperature was occasionally over 100° on 5 or 6 consecutive days

The coldest part of a normal day is about 6 A M , *i e* , a little before sunrise, and the warmest part is about 3 P M The temperature increases rapidly after sunrise till about 8-30 A M and at a decreasing rate till about 3 P M The temperature then falls at first slowly and rapidly at about sunset, later on it falls at a decreasing rate till near sunrise

The daily range of temperature, *i e*, the difference between the maximum and minimum temperatures recorded on any day is large during the dry months, *viz* , December to May and small from June to November The range is greatest in March and least in July and increases with the height of the station The values for Hassan during March and July are the greatest and the least for the four observatories, being respectively 28° 8 and 12° 2 Table II shows the mean diurnal range for the various months

April is the warmest month in the year and temperature will be high in the early part of May also especially when the usual thunder-showers do not occur The highest average maximum temperature is that for Chitaldrug, *viz* , 97° 0 occurring in April and the temperature for Hassan in July, *viz* , 77° 4 is the lowest. It is worthy of note that the maximum temperature at Hassan is lower in the months of July and August than in the months of December and January. This is due to the fact that the sky will be practically overcast during July and August The highest temperature

recorded in the State during the past 31 years was 103°·0 at Chitaldrug on the 15th April 1901 and 17th April 1903 At Bangalore the maximum temperature was a little over 100° only on 5 days for the last 31 years and the highest temperature was 101°·1 registered on the 29th April 1921 Bangalore situated as it is at a height of about 3 000 feet above sea level has a climate only second in attractiveness to that of the Nilgiris The maximum temperature was 100° four times at Mysore and only once at Hassan The monthly normals of maximum temperature are given in Table III and the absolute maximum temperatures for the various months are given in Table IV

The coldest months in the year are December and January The lowest temperature on record is 12°·7 registered at Hassan on the 12th December 1895 The temperature on the coldest day in the year has generally been below 50° at Hassan and the thermometer has not fallen below 51° at Chitaldrug During the past 31 years only on four nights the minimum temperature at Bangalore was below 50° and it was 50° only once at Mysore Table V shows the monthly normals of minimum temperature and the absolute minimum temperatures for the various months are given in Table VI

Rainfall.

The average annual rainfall for the whole State is 36 12 inches if stations located near the Western Ghats are not taken into account the average will be 28 01 inches. The State average for the best year on record was 51 12 inches in 1903 and in the worst year *i.e.* 1918 the average was 27 01 inches.

(1) *Local Distribution* —As one passes from the Western Ghats eastwards across the plateau of Mysore before hardly covering 50 or 60 miles he will have passed from regions of evergreen forests and torrential rainfall aggregating annually to as much as 300 inches or more

to regions where the annual rainfall will be 25 inches or less The rainfall ranges from 40 to 300 inches over a narrow belt, about 35 miles in width, forming the extreme western parts of the Districts of Shimoga, Kadur and Hassan Over the major part of the rest of the State, the precipitation ranges from 25 to 40 inches The rainfall for the following tracts is below 25 inches — the whole of the Chitaldrug District, the northern and the south-western parts of the Tumkur District, the eastern parts of Shimoga, Kadur and Hassan Districts, the south-eastern parts of the Mysore District, the northern parts of the Kolar District and a small tract of country in the north of the Bangalore District

Agumbi in the Shimoga District records the heaviest total for the year, the average value being 317 inches, in the years 1896 and 1897, the total for each year was 483 inches while it was 438 inches in 1922 In parts of the Chitaldrug District, like Nayakanahatti and Dharmapur, the average annual total is only 16 inches and in years of drought the annual total may be as little as 4½ inches as in 1923

The average rainfall for the basins of the important rivers in the Mysore State and also for the catchment area of the Markkanive Reservoir (now called Vani Vilas Sagara) is given in the following table Rainfall outside the State is not taken into account

Basins of rivers	*Average rainfall* Inches
The Cauvery	38 79
The North Pennar	24 76
The Palar	28 20
The Tungabhadra	39 94
The South Pennar	29 68
The Markkanive Reservoir	24 60

In another volume of this publication, will be found a map showing the position of the rain-gauge stations in

and the distribution of rainfall over the State Falls over 150 inches and below 20 inches are shown by actual figures. The map is based on rainfall normals obtained from official records up to the year 1920

Very little rain falls during the months of January and February i.e. the cold weather period the average for the State being only quarter of an inch these showers will be useful in keeping up the pasture supply of the country The best years on record for heavy rainfall during this season are 1901 and 1917 when the average for the State was about one and a half inches

Seasonal distribution of rainfall.

The rainfall during the hot weather period i.e. the months of March, April and May, is usually associated with thunderstorms when heavy rains occasionally accompanied by hailstones are not uncommon The strong vertical convection currents of air that prevail during this season cause the phenomenon The showers that fall during the season are locally known as mango showers and heavy falls of 4 to 5 inches have been recorded in a single day in a few stations. The average precipitation for this period is nearly five and a half inches The seasonal total may be as much as 8 to inches as in 1909 and as light as 2 inches as in 1906 the seasonal total for the Mysore District is 7 28 inches being the highest for all the districts The rain fall during this season is of great use for agricultural operations to be made before the onset of the South West Monsoon.

The South West Monsoon sets in early in June and prevails for about four months and a steady westerly wind sweeps across the plateau of Mysore with occasional breaks in its intensity When the winds are high the rainfall is chiefly confined to the *malnad* parts and the slackening of the wind is associated with heavy rainfall in the interior During this season July is the rainiest

month for the *malnad* tracts and September for the *maidan* parts In a normal year as much as 22½ inches of rain can be expected during the season. The years in which the seasonal total fell short of the normal by 25 per cent are 1899, 1905, 1918 and 1922, the worst year being 1918 with an aggregate of 11 92 inches, the best year was 1896 when the seasonal total for the State was nearly 35½ inches

The retreat of the South-West Monsoon commences nearly in October and is generally accompanied with heavy showers in the eastern parts of the State The season is popularly known as the North-East Monsoon period and prevails chiefly in the months of October and November and occasionally extends to December also, though December is generally a rainless month The mean seasonal total for this period is 8 17 inches, the bad years on record are—1897, 1899, 1908 and 1923 The last of these years is the worst on record, the rainfall for this period during this year being a little less than 2 inches The best year on record for this season is 1903, when the average for the State was a little over 15 inches, while the averages for the Bangalore and Kolar Districts were a little over 20 inches

In Tables VII and VIII, the monthly and seasonal distribution of rain for the various districts are given

Sunspots and rainfall in the State

Some relation seems to exist between the rainfall and the number of sunspots though it is not well marked. Years close to the sunspot maxima or minima are periods respectively of comparatively heavy or light rainfall A few outstanding cases may be mentioned. The year 1878 was one of sunspot minimum and the drought of 1876-77 just preceded it, the year 1923 when very little rain fell over the *maidan* parts was also one of minimum spots Other years of sunspot minimum were 1889, 1901 and 1913 and the corresponding

years of comparatively light precipitation were 1891 1899 and 1913 Thus years close to sunspot minimum are anxious periods for the State especially the *maidan* part of it. During the years 1893 1906 and 1916 the rainfall was in large excess the first two being years of sunspot maximum and the last preceded the year of sunspot maximum

Periodicity in rainfall gauged at Tumkur

In the earlier records of rainfall at Tumkur Town a marked periodicity can be observed though it is not noticeable during recent years From the year 1816 to 1870 the maximum amount of rainfall occurred every sixth year The period became one of four years from 1870 to 1886 and from 1893 to 1903 the period was one of five years. No periodicity however is to be found in the years following 1903

Rainfall and droughts in the State.

The years of drought are not separated by any definite interval. The Districts of Kolar, Tumkur and Chitaldrug are more frequently affected by droughts than the other districts. The following table shows the frequency of droughts during the past thirty-one years in the various districts of the State —

District	Average annual rainfall	Number of years in which the deficiency ranged from		
		15 to 30 per cent	30 to 50 per cent	50 per cent and over
Bangalore ..	30 95	6	1	0
Kolar	28 21	8	2	0
Tumkur	26-15	9	3	0
Mysore	28 16	6	0	0
Hassan ..	36 73	6	0	0
Shimoga	56-98	6	0	0
Kadur	73 45	5	8	0
Chitaldrug ..	21-05	8	1	0
State ..	36 12	6	0	0

It is worthy of note that the deficit ranged from 30 to 50 per cent in the Kadur District during 3 years out of 31 years, but it must be remembered that the annual average for this district is high, *viz*, 73 45 inches

Rainfall records are available for some stations in the State for a longer period The following table gives the liability for drought in one hundred years for some typical stations —

Stations	Average rainfall	Number of years in a century in which the deficiency ranged from		
		15 to 30 per cent	30 to 50 per cent	50 per cent and over
Agumbi	317 58	15	0	0
Bangalore	35 11	16	5	3
Tumkur	33 30	18	14	2
Sira	20 68	18	14	12
Chitaldrug	24 27	11	13	3
Challakere	18 02	14	8	12
Bagepalli	21 06	13	9	15

Pressure

Normally pressure is high in the cold and dry months of January and December and low in the months of June and July when warm and humid winds blow over the country Hourly records of the Bangalore Observatory show that there is a semi-diurnal oscillation in pressure, the times of maximum pressure being about 10 A M. and 10 P M and those of minimum pressure about 4 A M and 4 P M The pressures at 10 A M and 4 P M are respectively the highest and the lowest for the day and the difference between these is about one-tenth of an inch, pressure being expressed in inches of mercury, the difference between the day maximum and minimum is nearly double that between the night maximum and minimum The fluctuation in pressure from day to day rarely exceeds one-tenth of an inch and only once, *i e*, on the 23rd November 1916, when a cyclone passed over Bangalore, the pressure fell by 240 inches and

increased by about the same amount the next day Table IX shows the monthly and annual normals of pressure at 8 A.M reduced to 32°F

Wind velocity

The average wind velocity is less than 150 miles per day though occasionally during the South West Monsoon the velocity approaches 100 miles per day velocities less than 20 miles per day have also been recorded On a few occasions gusts of wind with a velocity of about 10 miles per hour have been recorded in the Bangalore Observatory but such gusts last only 10 or 15 minutes During the first three months of the South West Monsoon period *i.e* from June to August the average wind velocity is over 170 miles per day the average for Mysore during this period being over 200 miles per day Days of very little wind movement are large in the months of October and April Table X gives the daily normal wind movement for different months of the year

Humidity

Air is very humid during the monsoon period, *i e* from July to November and dry from January to April. March is the driest month as very little rain falls during this month the relative humidity has been as low as 6 per cent on a few afternoons. Normals of monthly and annual values of relative humidity are given in Table XI.

Cloud.

The cloud amount is estimated as follows if the whole sky is overcast, the amount is denoted by 10 and if it is clear by 0 If 4 is noted against the cloud amount it means that four tenths of the sky is covered by cloud July and August are the cloudiest months in the year and December to April is the period of greatest serenity March is the clearest month the normal cloud amount for Bangalore and Chitaldrug being as little as 1 1 and 1 3 Table XII gives the monthly and annual normals of cloud amount at 8 A M

Cyclones

The passage of cyclones over the State is a very rare phenomenon and it usually occurs just about the time of the burst of the South-West Monsoon, *i e*, in the month of May or at the time of its retreat, *i e*, in the months of October and November The cyclones that pass across the State have their origin in the south of the Bay of Bengal and pass into the Arabian Sea and occasionally give rise to stormy weather in the sea for some days The following details give some idea of the cyclones that have passed across the State

One on the 2nd of May, 1872, was very destructive in its effects, it blew a hurricane that overturned large trees even so far west as Coorg, and was accompanied by a deluge of rain Again on the 4th of May, 1874, when a cyclone was raging on the Madras coast, a steady rain poured at Bangalore, which continued without intermission for about 48 hours It had been preceded for several days by a still and hazy appearance of the atmosphere At the end of November, 1880, just at the beginning of the *ragi* harvest, when but little was cut and the bulk of this most important crop was all but ripe, a great part of the State was visited by a storm of wind and rain of unusual severity, which did very considerable damage to the crops, and was the cause, moreover, of the breaching of a number of irrigation tanks On the 16th of November, 1885, again, there was a continuous downpour lasting for more than forty-eight hours, but this was not of a violent character On the 3rd May 1909, a storm was generated off the south coast of Madras in front of a temporary advance of the monsoon current The disturbance drifted slowly in a north-westerly direction across Southern India and passed out into the Arabian Sea as a storm of moderate intensity The storm, though not severe, was the cause of heavy rain in South India including the Mysore State In Bangalore, there was a steady downpour of rain on the

5th continuing from 8 A M till past midnight with a break of about 2½ hours in the afternoon The total for the 24 hours ending 8 A M of the 6th was 6 06 inches being the heaviest total in one day recorded since 1893 Coming to recent years a disturbance that appeared in the Bay of Bengal crossed the Madras coast on the evening of the 16th October 1916 and traversing the Mysore Plateau crossed out into the Arabian Sea during the next 24 hours The rainfall on account of the passage of the storm was particularly heavy in the Mysore District Again in November of the same year a storm crossed the Coromandel coast near Madras at 2 hours on the 23rd morning causing much loss of life and damage to property It was central near Bangalore at 8 hours and by the morning of the 24th had passed out into the Arabian Sea. It caused widespread rainfall over the peninsula

I TABLE SHOWING THE MONTHLY AND ANNUAL NORMALS OF MEAN AIR TEMPERATURE

MONTHS	OBSERVATORY STATIONS			
	Bangalore	Mysore	Hassan	Chitaldrug
January	69 9	77 2	69·1	73 3
February	73 9	76 3	72 5	77 5
March	78 3	80 4	77 0	82 4
April	81 5	82 2	79 5	84 7
May	80 5	80 7	77 9	82 8
June	76 0	76 3	73 3	78 2
July	74 1	74 7	71 3	75 3
August	74 1	74 9	71 7	75 3
September	74 1	75 3	72 5	75 8
October	73 9	75 3	73 0	76 4
November	71 3	73 3	70 5	73 6
December	69 0	71 1	68 1	71 1
Year	74 7	76 1	73 0	77 3

II TABLE SHOWING THE AVERAGE MONTHLY AND ANNUAL DIURNAL RANGE OF TEMPERATURE

MONTHS	OBSERVATORY STATIONS			
	Bangalore	Mysore	Hassan	Chitaldrug
January	23 6	23 8	26 3	22 4
February	26 3	25 3	28 1	23 7
March	26 7	26 2	28 8	24 6
April	24 2	24 2	25 7	24 5
May	22 3	22 0	21 6	23 8
June	18 0	16 4	14 3	17 0
July	15 9	15 3	12 2	13 6
August	16 4	16 7	13 9	14 3
September	16 7	17 6	16 2	16 2
October	17 1	17 5	17 4	17 2
November	18 0	17 9	19 3	18 2
December	21 0	21 3	23 6	20 8
Year	20 6	20 3	20 6	19 7

III TABLE SHOWING THE MONTHLY AND ANNUAL NORMALS OF MAXIMUM TEMPERATURE

Months	Observatory Stations			
	Bangalore	Mysore	Hassan	Chitaldrug
January ..	81·7	84 1	82 3	84 5
February	87 0	89 0	86 6	89·4
March	91 7	93	91 4	91 7
April	93·6	94·3	92 4	97·0
May	91·9	91 7	88 7	91 3
June	83 0	84 5	80·4	86 7
July	82 1	82 3	77 4	82·1
August	82·3	82·2	8 0	82·4
September	82 4	84 1	80·6	83 9
October	82·4	84 1	81 7	8 ·0
November	80·3	82·3	80 2	83·7
December	79 5	81 8	79 9	82·1
Year	83 0	86 2	83·3	87 1

IV TABLE SHOWING THE ABSOLUTE MAXIMUM TEMPERATURE RECORDED AT THE FOUR OBSERVATORY STATIONS SINCE 1893

Months	Observatory Stations			
	Bangalore	Mysore	Hassan	Chitaldrug
January ..	100·5	91 2	89 1	93·0
February ...	93 5	95 1	9 ·0	97·0
March	98·3	99 0	97·9	101·0
April	101 1	100·0	99·1	103 0
May	100 8	100·4	100 2	102 8
June	96·6	97·6	93·7	100 2
July	91 1	91 9	86·2	92·8
August	91·9	93 0	86 6	91 0
September ..	90·7	91·9	90 2	93 1
October	89·3	91·2	88 5	93 9
November ...	86 3	89·2	86 4	91 1
December	87 5	88 8	87 4	90 1
Year	101 1	100 9	100 2	103 0

V TABLE SHOWING THE MONTHLY AND ANNUAL NORMALS OF MINIMUM TEMPERATURE

MONTHS	OBSERVATORY STATIONS			
	Bangalore	Mysore	Hassan	Chitaldrug
January	58 1	60 3	56 0	62 1
February	60 7	63 7	58 5	65 7
March	65 0	67 3	62 6	70 1
April	69 4	70 1	66 7	72 5
May	69 1	69 7	67 1	71 4
June	67 0	68 1	66 1	69 7
July	66 2	67 0	65 2	68 5
August	65 9	66 5	64 7	68 1
September	65 7	66 5	64 4	67 7
October	65 3	66 6	64 3	67 8
November	62 3	64 3	60 9	64 5
December	58 5	60 5	56 3	61 3
Year	64 4	65 9	62 7	67 4

VI TABLE SHOWING THE ABSOLUTE MINIMUM TEMPERATURE RECORDED AT THE FOUR OBSERVATORY STATIONS SINCE 1898

MONTHS	OBSERVATORY STATIONS			
	Bangalore	Mysore	Hassan	Chitaldrug
January	48 9	51 7	45 9	52 0
February	51 2	54 1	46 9	56 3
March	52 3	57 9	49 4	61 2
April	58 3	61 3	58 1	59 3
May	61 8	60 4	58 4	59 3
June	59 4	62 0	52 4	61 8
July	61 7	62 8	59 1	62 5
August	61 9	62 0	59 7	61 7
September	59 2	59 3	56 8	63 3
October	56 0	57 4	53 4	59 9
November	52 0	52 6	46 5	51 3
December	48 7	50 0	42 7	51 2
Year	48 7	50 0	42 7	51 2

VII TABLE SHOWING THE DISTRICT MONTHLY AND ANNUAL RAINFALL NORMALS

Districts	January	Feb.	March	April	May	June	July
	Inches	Inches	Inches	Inches	Inches	Inches	Inches
Bangalore ...	0 12	0·15	0 40	1·28	4 02	2 69	3·14
Kolar ...	0·20	0 12	0·33	1·00	3 00	2 11	3 18
Tumkur ...	0 09	0·13	0 22	1 10	3 21	2 3	2 69
Mysore ...	0·14	0·16	0 41	1·99	4 85	2 37	2·21
Hassan ...	0 09	0·15	0·29	2 01	1·01	5 38	6 43
Shimoga ...	0 09	0 06	0·23	1 1	2·85	16 99	18 20
Kadur ...	0 14	0·12	0·38	1 88	3·56	15 80	23 91
Chitaldrug ...	0 09	0·12	0·18	0 99	2 63	2 11	2 55
State ...	0 12	0·13	0 31	1 46	3 08	4 79	7 15

Districts	Aug	Sept.	Oct	Nov	Dec	Year
	Inches	Inches	Inches	Inches	Inches	Inches
Bangalore ...	4 03	6·29	5 33	2·13	0·42	30·20
Kolar ...	3 80	5 77	4·15	3 00	0 51	28·21
Tumkur ...	3 27	5 61	4 31	2·16	0·29	26 15
Mysore ...	2 66	4 38	6 67	2 03	0 41	28 16
Hassan ...	4·81	4 09	5·91	2 91	0 61	38 73
Shimoga ...	10 23	4 67	5 07	1·75	0 39	80 98
Kadur ...	15 59	6 44	6 5.	2·16	0 65	79·45
Chitaldrug ...	2·37	4 33	3·19	1 63	0 33	21·93
State ...	5·23	5 18	5 30	2·12	0·46	36 12

VIII. TABLE SHOWING THE DISTRICT SEASONAL RAINFALL NORMALS

Districts	January and February (cold)	March to May (hot)	June to September (South West Monsoon)	October to December (N. E. Monsoon)	Year
	Inches	Inches	Inches	Inches	Inches
Bangalore ...	0 27	5·70	16 58	8·40	30·93
Kolar ...	0 32	4 35	15·25	8 29	28·21
Tumkur ...	0 23	4 54	14·01	7 36	26 15
Mysore ...	0 30	7·28	11 65	8·93	28 16
Hassan ...	0·24	8·34	22·64	9 51	38·73
Shimoga ...	0·15	4 61	45·01	7·21	56·98
Kadur ...	0 26	5·77	57·76	9·66	79·45
Chitaldrug ...	0 21	3·60	11·77	6 17	21·95
State ...	0·25	5 35	22·35	8 17	36 12

IX TABLE SHOWING THE MONTHLY AND ANNUAL NORMALS OF PRESSURE AT S A M REDUCED TO 32°F

Months	Observatory Stations			
	Bangalore	Mysore	Hassan	Chitaldrug
	Inches 26+	Inches	Inches	Inches
January	1 093	1 522	0 911	1 621
February	1 015	1 502	0 895	1 596
March	0 938	1 473	0 872	1 565
April	0 915	1 429	0 827	1 516
May	0 905	1 397	0 796	1 482
June	0 853	1 351	0 710	1 414
July	0 851	1 335	0 710	1 417
August	0 881	1 385	0 770	1 452
September	0 916	1 408	0 801	1 433
October	0 956	1 445	0 840	1 540
November	0 995	1 478	0 877	1 587
December	1 028	1 513	0 906	1 619
Year	0 918	1 439	0 831	1 526

X TABLE SHOWING THE MONTHLY AND ANNUAL NORMALS OF WIND VELOCITY IN MILES PER DAY

Months	Observatory Stations			
	Bangalore	Mysore	Hassan	Chitaldrug
January	135	117	85	102
February	127	125	84	92
March	121	124	93	91
April	113	127	103	90
May	132	159	138	142
June	195	228	176	171
July	194	228	184	184
August	172	204	160	168
September	132	162	127	138
October	103	116	87	84
November	114	128	86	91
December	129	159	97	110
Year	139	159	119	122

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CHAPTER IV

BOTANY

I Forest Flora

Richness of the flora

The situation of Mysore within the tropics combined with an elevation which gives it an equable climate the great variation in rainfall within it and its almost complete environment by lofty mountain chains are features which contribute to the formation of a rich and varied flora

Area of forests

The reserved forests and plantations of the country cover a total area of 3 685·9 square miles exclusive of District and unclassed forests

Forest belts

The forest area can be divided into three more or less distinct belts running from north to south Starting from the extreme west there are —

(i) *The evergreen belt* —This stretches along the Western Ghat slopes with a width varying from 6 to 40 miles from about the north of Sorab to the south of Manjarabad

(ii) *The deciduous belt* —This is at present the most valuable timber tract and lies to the east of the above and extends more or less continuously from the north of Shikarpur to Chamrajnagar, varying from 20 to 30 miles in width

(iii) *Dry deciduous fuel tract and scrub* —This lies to the east of the central waterparting of the State and runs north to south in two narrow strips.

Each of these types of forests may be further differentiated as follows —

(a) *The moist evergreen belt* —The pure moist evergreen forest stretches in a narrow strip along the Western

Ghats for over 225 miles from the Jog Falls in Sagar Taluk to Bisale Ghat in Manjarabad The approximate area of the forest is 1,000 square miles The tract is mountainous with deep ravines and narrow valleys Bare grassy ridges with richly wooded valley slopes are the characteristics of this belt, the annual rainfall in this region is about 250 inches The typical species of trees to be found in this area are —

Balagi	Poeciloneuron indicum	
Surahonne	Calophyllum Inophyllum	Tho Alexandrian laurel
Dhuma	Dipterocarpus indicus	
Yennemara	Hardwickia pinnata	
Sataga	Elæocarpus tuberculatus	
Ranja	Mimusops Elengi	
Nagasampige	Mesua ferrea	Ironwood tree
Hadasale	Dichopsis elliptica	
Dalchinni	Cinnamomum zeylanicum	
Guragi	Garcinia indica	
Ramanadike	Myristica magnifica	
Karimarlu	Diospyros Spp	
Balo	Diospyros ebenum	Ebony

Kinalbhogi (*Hopea parviflora*) is found in some places over extensive areas Devagarige (*Dysoxylum malabaricum*) and Mangappe (*Toddalia bilocularis*) are found in small numbers Nandi (*Lagerstroemia lanceolata*) and Hebbahalasu (*Artocarpus hirsuta*) are met with occasionally The tract is very thinly populated with scattered and isolated hamlets Except for the few provincial roads that cross the frontier, there are no other roads or means of communication.

The important forests in this tract

The following forests may be mentioned as the most important ones in this tract —

Jog	Agumbe
Govardhanagiri	Balehalli
Kilmdur	Narasimha parvata
Varthi	South Bhadra and Tungabhadra, Kabbinalo, Bisale, Kemphole and Kagneri

(*b*) *Mixed belt of evergreen and deciduous forests.*— This is a broader strip of forest about 30 miles broad and

extends from the north of Sorab to the south of Manjara bad through Sagar Nugur Tirthahalli Narasimharaju pura, Koppa Mudgere und Belur Taluks But for nnmerous villages and hamlets large puddy uud urecanut tracts, end extensive clearings for *Soppinabettas* this belt forms one rich stretch of forest with many valuable timber species Though better than the last, the populu tion is thin. There ure rough cart-tracks leading from hamlet to hamlet The lubour supply is scanty Tho principal species of trees found growing over this tract are —

Hunal	Terminalia paniculata
Mathi	Terminalia tomentosa
Nandi	Lagerstramia lanceolata
Neria	Eugenia Jambolana
Jambe	Xylia dolabriformis
Gandhagarige	Cedrela Toona
Kalgarige	Chickrassia tabularis
Hebbahalasu	Artocarpus hirsuta
Haiga	Hopea wightiana
Naviladi	Vitex altissima
Holagara	Holigarna Arnottiana
Gobbaranerin	Bischofia Javanica

Dalchinui (*Cinnamomum zeylanicum*) and Guragi (*Garcinia indica*) and other *kan* species are found only in the shady valleys or ravines called *kans* Hobbidaru (*Bambusa arundinacea*) is largely found Occasionally Jalari (*Shorea Talura*) seem to grow in pure crops. Sandal is particularly abundant in this region.

The rainfall is from 60 to 100 inches or a little more

The following are the important forests in this tract :— The important forests in this tract.

Sagar *kan* forests	Ubbur
Bellandur	Aramballi
Mallandur	Kusgal
Masrur	Mallandur gudda
Harohittal	Halasur
Hanagere	Koppa and Mudgere forests.

(ii) *Deciduous teak high forest belt* —The last named tract gradually merges into this forest belt in Shimoga and Kadur Districts and along the frontier in Mysore

District and extends from Shikarpur to the extreme end of Chamrajnagar, with a break in Hassan The average annual rainfall over this portion is from 45 to 60 inches This is the most valuable strip of teak forests in the State and is about 647 square miles in extent The most important species is teak, its valuable associates are the following —

Bete	Dalbergia latifolia	Rosewood tree
Matti	Terminalia tomentosa	
Honne	Pterocarpus marsupium	Gum kino tree
Thadsal	Grewia tiliæfolia	
Dindiga	Anogeissus latifolia	
Yethega	Adina cordifolia	

Other deciduous species like Godda (*Garuga pinnata*), Buruga (*Bombax malabaricum*), Sagade (*Schleichera trijuga*), Kadavala (*Stephegyne parvifolia*), Bende (*Kydia calycina*), Nelli (*Phyllanthus Emblica*), Kuli (*Gmelina arborea*), etc, make up the rest of the forest with a dense growth of small bamboo over hill slopes and ridges, big bamboos being confined to the banks of streams and moist low lying tracts

The principal species attain very good size, teak, bete (Rosewood), yethega (*Adina cordifolia*) and honne (Gum-kino tree) ranging in girth from 10 to 15 feet and matti and other species of girth varying from 8 to 12 feet are very common

In the outskirts of this belt of forests, there are well populated villages and the forests themselves attain heights averaging about 70′, are easy of access with convenient fair weather roads, and equipped with well-designed and comfortable Inspection Lodges, staff and labour quarters

The important forests in this belt

The following are the important forests in this belt —

Karadibetta	Chornayedehalli
Kumsi	Aldhara
Shankar	Muthodi
Sakrebyle	Thegurgudda

Lakkavalli	Kakankote
Dodharave	Begur
Mavakal	Mavur marigudi
Katchuvanahalli	Beramballi
Veeranahosahalli	Bandipur
Mettikuppe	Chamrajnagar

Deciduous teak pole belt—The strip of forest which extends from Anavatti in Sorab to Chamrajnagar is similar in composition to the above, but the growth is very poor the trees not attaining a girth of more than about 4 feet anywhere The average rainfall varies from 30 to 35 inches and the crop is open with an under growth of grass. The forest yields small timber The total area of this type of forest is about 262 square miles The major portion of this belt of forest has all conveniences in the matter of roads and labour The principal forests that may be enumerated under this type are :—

Kowdi	Thyagadahagi
Chandrakal	Portions of Veeranabhsahalli and Mettikuppe
Kunchenahalli	
Kukwada-ubrani	Kataal
Antargange	Naganapur
Bhadrapur	Bargi and portions of Chamrajnagar
Hadikere	

(iii) *Dry deciduous fuel forest*—This may also be divided into two definite strips of forests on account of certain characteristic differences.

(*a*) *Superior type of fuel forest*—This strip starting from about the south western limits of Davangere Taluk extends to the north of Channapatna. Towards the east it extends to the provincial boundary of the State in the Bangalore and Kolar Districts. The average rainfall over this tract varies from 25 to 30 inches. The principal species to be found are —

Kaggali	..	Acacia Catechu	... The Cutch tree
Devadari	..	Erythroxylon monogynum	
Chigare	...	Albizzia amara	
Channangi	..	Lagerstroemia parviflora	

the evergreen belt but is most abundant in the semi moist belt, in the Talukas bordering on the Cauvery and in those lying along the chain of hills which runs from Kankanhalli up to Maddagiri In the Chitaldrug and Kolar Districts it occurs to a limited extent, chiefly scattered in village lands and hedge rows and in special plantations and forests introduced by the Forest Department

(*b*) *Its growth* —The tree attains its greatest bulk and height in talaks with a moderately heavy rainfall The bark and sapwood have no fragrance, but the heartwood and roots are highly scented and rich in oil The girth of a mature tree varies, the average being about 30" while trees of girths up to 6 feet are occasionally found Heights up to 40' have been measured though the average height is not more than 25' The tree is considered to be mature when about 60 years of age. The older the tree the greater the proportion of heartwood The bark becoming deeply wrinkled is red underneath and frequently bursts, disclosing in old specimens the absence of all sapwood In colour and marking four varieties of the wood are distinguished —*bili* white *kempu*, red *naga* cobra and *navilu* peacock The names indicate the supposed resemblance of the marks which are really caused by the death of adventitious buds. The heartwood is hard and heavy weighing about 61 lbs per cubic foot

(*c*) *Its Propagation* —Efforts for the propagation of sandal by planting did not meet with much success some years ago, owing to the delicate nature of the young plant and its exposure to the ravages of hares and deer More recently, the *lantana* shrub which grows with the rankness of a weed has been found to be an effectual curse for the seedlings coming up naturally in abundance. Sandal sown up has given fairly good results.

(*d*) *Spike disease.*—This serious disease of sandal was first reported from Coorg, near the Coorg Mysore

boundary in 1898 Since that time, it has spread across Mysore District to the Eastern border and has made its appearance in the neighbouring Districts of Madras Presidency It has also spread into Hassan and Bangalore Districts It has been estimated that the annual losses from this disease amount to between Rs 5 and 6 lakhs

A considerable amount of scientific investigation of this disease has been carried out, more especially by the Mysore Agricultural Department, and the Forest Officers in Mysore, Madras and Coorg heve studied it extensively in the field. Although the disease has been communicated to healthy trees by graft experiments, the causes of the disease have not yet been found out The work of investigation is being organized and the appointment of a special scientific officer to aid in this work has been sanctioned by Government

A reward of Rs 10,000 has also been offered by the Government to any one who discovers the cause of the spike disease and suggests an effective, cheap and easily applicable remedy for the eradication of this disease

II Horticulture, Etc

General

The climate of Mysore is very favourable to horticulture With judicious treatment, plants of all climates may be successfully grown at Bangalore. Horticulture has made great progress, as may be judged from a visit to the Palace Gardens in Mysore and Bangalore maintained by His Highness the Maharaja, the public gardens maintained by the State at Bangalore, Mysore, Seringapatam and the Nandi Hills and the horticultural activity displayed by the public

The Lal Bagh

The Lal-Bagh is the oldest and most important of the public gardens It contains a fine collection of plants

and trees rarely seen in India in such large specimens The collection is being periodically replanted or added to according to natural orders and with regard to geographical distribution

Indian fruits and a large variety of English fruits are grown in the vicinity of Bangalore The following are the more important fruit trees grown in the gardens — Fruit trees.

Anacardium occidentale	Cashew nut ..	Geru
Anona reticulata ..	Bullock Heart ..	Ramphal
Anona squamosa ..	Custard apple ..	Sitaphal
Artocarpus integrifolia ..	Jack ...	Halasinamara
Averrhoa carambola ..	Carambola ...	Kamarak
Carica papaya	Papay ...	Berangi
Citrus aurantium ..	Orange ..	Kittale
Citrus decumana	Pumelo	Sakote
Citrus medica	Citron ..	Madala
Citrus medica var acida	Lime	Nimbe
Citrus medica var limetta ...	Sweet lime	Cheenimbe
Citrus medica var limonum ..	Lemon ..	Hirile
Cocos nucifera	Cocoanut palm	Tenginamara
Eriobotrya Japonica	Loquot	Lakote
Eugenia jambos	Rose apple	Pannerale
Ficus carica	Fig	Anjura
Mangifera indica	Mango ..	Mavinamara
Musa sapientum	Plantain ..	Bale
Phyllanthus distichus ..	Star-gooseberry ..	Kirinelli
Phyllanthus emblica ..	Emblic myrobalan	Nelli
Psidium guajava ..	Guava	Sibpe
Punica granatum ..	Pomegranat ...	Dalimbe
Pyrus malus	Apple	Sevu
Vitis vinifera	Vine ..	Drakshi
Zizyphus jujuba (Ber) ..	Bere ...	Elchi
Eugenia malaccensis	Malay Rose apple	Sime pannerale
Nephelium Litchi	Litchi ..	Kannugudikhannu
Pyrus communis ...	Pear ..	Perutai
Rubus fusicarpa	Raspberry ..	Rajahari
Achras sapota	Sapodilla ..	Sapodilla
Anona muricata	Soursop Peaches	Mulludoranji

Washington Navel orange introduced from Australia, is becoming a favourite in gardens The best oranges are those imported Of mangoes there are many varieties Plantains are plentiful and some varieties are esteemed for their sweetness and flavour

Vegetables

There is a large number of gardens in Bangalore and Mysore which supply the market with a rich assortment of both English and Indian vegetables The chief among them are beans, soybeans, tomatoes, cabbages, cauliflower, knol-khol, pumpkins, gourds, cow-gram, moringa fruit, brinjals, country greens, sweet potatoes, radish and chow-chow The potato and the onion are grown on a large commercial scale Leaves of vegetables and roots fit for *curries* are also grown

Grasses

Of grasses indigenous to Mysore. the following are fit for stacking —

(1) Garike (Cynodon dactylon)
(2) Ganjalu garike (Andropogon Bladhii)
(3) Hanchi (Aristida caerulescens)
(4) Karda (Andropogon pertusus)
(5) Dharbhe (Eragrostis cynesuroides)
(6) Phara or Mani
(7) Uppala,
(8) Sunti (Panicum repens)
(9) Node
(10) Solali
(11) Marahullu

The following are not good for stacking, as they grow mixed together —gondyada or chenlagam, bhimam, bidiru-yele, yenuamatti, bili-hullu, timmattakam, nallbala, akki-hullu, hire

There are also certain plants or herbs which are of great use to cattle, the best of these is called *puritanipuli* which has seeds like burrs, with a thick joined sappy stem It grows along the ground, and is very good for milch cattle.

Imported fodders

Among the imported fodders, lucerne (*medicago sativa*), Guinea grass (*Panicum jumentorum*) and Rhodes grass (chloris virgata) are largely cultivated

III Crops

Classification of the principal crops

The principal crops raised in the State may be classified briefly as follows —

(*a*) Wet, or those that are dependent for their

growth on irrigation in addition to timely rainfall, viz —

Oryza sativa	Paddy ..		Bhatta nellu
Saccharum officinarum	Sugar-cane		Kabbu
Triticum Sativum	Wheat		Godhi

(*b*) Dry or those which do not require irrigation generally but are dependent entirely on seasonal showers of rain viz. —

Eleusine Coracana	Ra i		Ragi
Sorghum vulgare	Gr at millet ..		Jola
Cajanus Indicus	Pigeon Pea, Dhal ..		Togari
Cicer Aristinum	Bengal gram Chik pea.		Kadale
Dolichos biflorus	Horse gram		Hurali
Dolichos lab lab	Cow gram		Avare
Phaseolus Mungo	Green gram ...		Hesaru
Phaseolus Mungavar ... ... Phaseolus radiatus	Black gram ...		Uddu
Sesamum Indicum	Sesame gingelly ...		Wollellu, Achellu
Ricinus communis ..	Castor		Haralu
Gossypium Herbaceum ...	Cotton		Arale
Nicotiana Tabacum	Tobacco ...		Hogesoppu

(*c*) Garden crops, or those which require a moist situation and an adequate supply of water —

Areca catechu	Arecanut		Adike
Musa Sapientum	Plantain		Bale
Cocos Nucifera	Cocoanut ...		Tenginakayi
Elettaria cardamomum ...	Cardamum ..		Yelakki
Arachis hypogæa	Groundnut ...		Kallekayi nela kadale
Capsicum annum	Chilly		Menasinakayi
Allium Cepa	Onion		Nirulli
Allium Sativum	Garlic		Bellulli
Carum copticum ..	Bishop's weed		Oma
Carthamus Tinctorium ..	Safflower		Kusumba
Coriandrum Sativum ...	Coriander		Kottambari
Curcuma Longa	Turmeric		Arisina
Trigonella Fœnum graecum ..	Fenugreek		Mentya
Zingiber officinale	Ginger		Sunti
Cuminum cyminum	Cummin seed ..		Jirige
Piper beetle	Betel vine		Vilelele

Mulberry (*Morus indica*) is cultivated both in garden lands and dry lands Coffee (*Coffea Arabica*—Bundu kapi) is a miscellaneous crop grown in the Malnâd regions of the Kadur and Hassan Districts.

In the *Season and Crop Report*, the crops are classified as —

(*a*) Foodgrains comprising rice, ragi, wheat, millet, pulses,
(*b*) oil-seeds, comprising mustard and rape and gingelly,
(*c*) condiments and spices,
(*d*) sugar-cane,
(*e*) fibres including cotton and jute,
(*f*) dyes,
(*g*) drugs and narcotics comprising coffee, tobacco, etc,
(*h*) fodder crops,
(*i*) orchards and garden produce and
(*j*) miscellaneous

Industrial and Commercial crops

The principal industrial and commercial crops grown on a fairly large scale in the State are sugar-cane, coffee, cotton, cocoanut, arecanut, mulberry and oil-seeds

IV Avenue Trees and Topes (Arboriculture)

Avenue trees

Along the public roads, avenue trees have been planted The trees have been numbered, and vacancies are filled up and additions made annually

Topes

Almost every village and many of the wealthy raiyats have topes or groves in which trees valued for their timber, fuel, shade or fruits are grown

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CHAPTER V.

ZOOLOGY

I Introduction

Introduction

THE plateau of Mysore, surrounded practically on three sides by mountain ranges, is diversified by certain well-known physical characteristics The Malnād tract which includes Shimoga, Kadur and Hassan Districts, is an undulating country with open valleys, covered by heavy forests and hills which now and then rise into bare crags in the higher altitudes The level plains, which constitute at any rate the greater part of the Maidān, derive their character from the means of water-supply and the nature of the soil determining the cultivation The fauna of the country lying west of the line drawn roughly from Shikarpur to Periyapatna which fairly comprises the Malnād, is both in richness and variety, comparable with that met with in Malabar and Travancore In fact, the Western Ghats and the parallel ranges in South Kanara and Mysore, together with those picturesque forest-clad spurs, harbour practically all the animal life that is of interest to the sportsman and the scientist in South India There are many points of similarity between the animals occurring in these parts and those found in the south-western regions of Ceylon and they both differ considerably from those found in the northern portions of the Peninsula It must be remarked, however, that even in the southern parts of India, animal life is by no means uniform and in a tract of country like Mysore, with its sharply contrasted physical features, the difference in the occurrence and abundance of animal life is greatly emphasized It would be impracticable, were it even

desirable to deal in great detail with even the known forms in a chapter such as this and therefore nothing more is attempted here than to offer a few brief remarks on the vertebrate fauna of Mysore.

II *Mammals*

Mammals are warm blooded hairy animals whose main characteristic is the possession by the female of milk glands. They occupy the highest place in the animal kingdom chiefly by the superior organization and complexity of their brain structure The occurrence of a delicate series of boneIets for transmission of sound to the internal ear at once marks them out from birds and reptiles The small number of bones which make up the lower jaw and its more compact attachment to the skull giving greater biting power, would be other distinguishing qualities The classification adopted by W T Blanford as revised by R. C Wroughton, Thomas and Hinton is followed in this chapter

Family Cercopithecidæ

The monkeys occurring in Mysore belong to the two genera, *Macaca* and *Pithecus* and perhaps number about half a dozen species The Lion tailed Monkey (*M ferox Schr*, the lion tailed monkey of Jerdon and the Wanderoo of Buffon) is an inhabitant of the unfrequented parts of the dense jungles reaching considerable elevations on the Ghats. Its savage disposition an elongated snout great power of teeth and tufted tail which account for its popular name make it resemble the Baboon, from which it differs however externally by its black coat and a grey beard and ruff The Bonnet Monkey (*M sinica L*) frequents not only the dense jungles, but also populous towns and villages where it raids fruit and grain shops. This monkey which is easily distinguished by its flesh coloured face and ears and radiating hair on the crown is frequently trained by itinerant beggars to perform various

tricks For general intelligence and power of mimicry, it is excelled only by its northern congener, the Bengal Monkey (*M rhesus And*) which has not been reported south of Bombay and the Godavari The members of the next genus (*Pithecus*) which constitute the Langurs or Hanuman Monkeys, are easily distinguished from the foregoing by their slender build and absence of cheek-pouches The common South Indian Langurs or Hanuman Monkeys (*P entellus anchises Blyth*) have a black face, ears and soles—characteristics somewhat inconsistent with the sanctity in which they are held It is interesting that very young babies have a flesh-coloured face which darkens with increasing age Their favourite haunts are the far-off groves near villages, high trees on the banks of streams and rocky hills They are looked upon by sportsmen like friends as they give a warning cry on the approach of tigers and panthers. The other Langurs reported to occur in the State are the Madras (*P priam Blyth*), Malabar (*P hypoleucos Blyth*) and the Nilgiri (*P johnii Fischer*) Hanuman Monkeys In the case of the first species, the hair on the hind part of the crown is drawn out into a crest and the hairs on the brow form a fringe, these characters are lacking in the Malabar Langur The Nilgiri Hanuman Monkey has a black silky coat except on the head and nape, which are fulvous All of them, as a rule, are extremely wary and shy and are confined to the higher altitudes in the dense woody districts bordering on the Western Ghats and the Nilgiris.

Lemurs

The *prosimiæ* or Lemurs are represented in Mysore by the *Loris*, which is peculiar to South India and Ceylon. The members of this family are distinguished from the true monkeys by certain well-known anatomical peculiarities, all of which indicate a low grade of organization among the primates The upper incisors in all Lemurs are

divided by a toothless gap and there is a claw instead of a flat nail on the second digit of the foot The tail is usually wanting The Mysore Slender Loris (*Loris lydekkerianus Cabr*) known from the malnad districts also extends into Coorg This little animal is entirely nocturnal and arboreal in its habits and its food consists of insects birds eggs and small reptiles and in confinement takes cooked rice and bananas The Mysore Lemurs are said to mimic the spotted owl (*Athene brama*) in so far as their cry resembles the screechings of the latter The Slender Loris (*L malabaricus Blaugh*) has been known from S Coorg and its occurrence in Mysore is more than probable

Family *Felidæ*

The cats are the most specialized among the carnivora possessing a rounded head retractile claws and a flesh tooth in the jaws. Among the larger cats are the lion and the tiger There is no record of the lion ever having been found in the State though if Mysore architecture is to be believed it should have been familiar to people in it. The tiger at one time must have been more largely found The killing of a tiger by Sala the founder of the Hoysala dynasty by thrusting a rod in its mouth is perhaps the most popular tale in all Mysore The fact that every Hoysala temple has this feat represented on it and every Hoysala coin had it on its obverse shows that the figure of the tiger as an emblem was thoroughly appreciated Man-eaters are even now to be met with occasionally in the districts of Mysore Shimoga and Tumkur The indiscriminate slaughter of the tiger (*Felis tigris L*) by sportsmen is causing its disappearance from the Indian jungles and for fear of total extinction the animal is now protected by law The improved means of communication and the clearance of jungles around villages no less than the decline in the population of tigers within recent times must account for the

comparative immunity now enjoyed by the country side from the attentions of the man-eaters. There is a mass of fact and legend inseparably mixed up about the habits of tigers in general Cattle-lifters and man-eaters which are the boldest and most cunning of their race, must have nearly depopulated villages in the backwoods before the introduction of fire-arms, and from the view-point of dwellers in such localities, the game-killers are the real friends and helpers of man, in so far as they keep down herds of deer and wild pig which would otherwise destroy much crop The panthers or leopards (*F pardus L*) are very common in Mysore, more especially in the districts of Mysore, Shimoga and Kadur, and certainly come after the tiger in point of power of offence or relative proportions As regards cunning and courage, or excitability of temper and destructiveness, they easily occupy the first rank among the beasts of prey. They come more frequently in collision with man as they live in close vicinity to his habitations, to sally forth in the dark to seize cattle and other animals The number of cattle killed by tigers and panthers is perhaps heaviest in the districts of Shimoga, Kadur and Mysore

The panther varies between wide limits, some at any rate of the differentiating characters being due to age It is not uncommon among Indian naturalists to recognize two forms, the larger with a shorter tail, a longer head and broad rosettes on a paler ground colour, the smaller possessing the opposite characteristics. In addition to these varieties, if they are really so, we have the black panther in Mysore, where it is confined mostly to the wooded tracts In the Mysore menagerie, the black and the ordinary forms are confined in the same cage, obviously to induce interbreeding There is, however, evidence to prove that the process of cross-breeding takes place in Nature Till some other distinguishing anatomical quality than mere colour is forthcoming, the

melanoid individual ought to be content with the humbler rank of a variety in *systema Naturæ* The leopard cat (*F bengalensis Kerr*) known from Coorg and possibly Mysore also is far too fierce for its size the length of body (excluding the tail) being only 26 inches and indefinitely maintains a savage disposition In the menageries, as in Mysore it is never seen pacing the cage after the manner of the bigger cats but will spend practically all the days of its life crouching in a corner or on a window sill Living by day time in the holes of trees or under stones in dense jungles it issues forth in the evening to commit depredations on the poultry and small mammals near about the villages. The colour markings of this cat are variable. The rusty spotted cat (*F rubiginosa Geoff*) is somewhat smaller than the domestic cat, and according to Jerdon is tameable Its occurrence in Mysore is doubtful The only other jungle cat reported from Mysore is the common Indian species (*F affinis Gray*) frequenting jungles and open country It is partial to game like hares and partridges, occasionally destroying poultry also In respect of the long hairs at the tips of their ears, they come nearer to the Lynx The hunting leopard or cheeta (*Acinonyx venaticus Gray*) which may occur as a straggler in Mysore is usually distinguished from the panther by the non retractile or only partially retractile claws and a slender long legged body The spots are smaller and solid When tamed it becomes perfectly docile like a dog and has the canine instincts of attachment and obedience to its master In Northern India, it is widely employed in hunting down antelopes gazelle and nilgai which it can easily overtake by its remarkable speed for short distances. Buchanan Hamilton gives an interesting account of the manner of hunting with the cheeta, which he gathered in a conversation with Sir Arthur Wellesley who, while Commanding Officer at Seringapatam had kept five of these

hunting leopards which had formerly belonged to Tippu Sultan

Family Viverridæ

The small Indian civet cat (*Viverricula malaccensis Gmel*), the Indian toddy cat (*Paradoxurus niger F Cuv*), the common Indian mongoose (*Mungos mungo mungo Gmel*) and (*Mungo Elliotı Wrought*), differ from the foregoing family in having an elongated snout, non-retractile claws, and more teeth in the hinder part of the jaws The body is slender and elongated, an adaptation for an arboreal and burrowing mode of existence The Indian civet cat, kept in confinement by the Indians, secretes the well-known perfume in its preanal glands, which enters largely into the cosmetics of the Indian toilet. In its native haunts of detached woods and copses, it may be seen wandering both by day and night in quest of field rats, squirrels, and birds' eggs The Indian toddy cat, also known as the palm-civet, whose favourite residence is the palm or mango grove, frequently establishes itself in the thatched roofs of houses. It derives its popular name from its alleged fondness for palm juice According to Jerdon, "it has a keen sense of smell, but less acute hearing and vision by day than the mongooses" There are three species of mongoose in Mysore (*M Mungo mungo Gmel*, *M fuscus Waterh and M vitticolis Benn*), some at any rate are common in hedgerows, thickets and cultivated fields The supposed immunity of this animal from snake poison is simply due to its extreme agility

Family *Hyænidæ*

There is only one representative of the family of *Hyænidæ* in India and its occurrence is mainly confined to the drier districts. Hyænas form a sort of connecting link between the cats and the civets and have a canine look about them Though universally detested for their extreme cowardice and cruelty, these animals are serviceable as carrion feeders

The dog tribe includes the common wolf (*Canis naria Wroughton*) the Indian jackal (*Canis indicus Hodgs*) the wild dog (*Cuon dukhunensis Sykes*) and the fox (*Vulpes bengalensis Shaw*) These animals which inhabit the Malnād tracts are known for their remarkable intelligence and cunning which they must have acquired through habits of communal life The jackal and the fox occasionally turn their attention to a vegetable diet and under its influence may destroy wide areas under cultivation, chiefly of coffee, ground nuts sugarcane and horse gram The wolf and the wild dog which hunt in packs are most destructive to game like sambar antelope spotted and barking deer Family *Canidæ*

The martens which constitute the family of *Mustelidæ* differ among themselves both in external conformation and the character of teeth far more perhaps than is the case in any other family of carnivora. The South Indian marten (*Martes gwatkinsi Horsf*) found in tolerable numbers in the hill forests of the Nilgiris and on the Western Ghats may cross the British frontier into the adjoining tracts of the Mysore territory like its congener the common otter (*Lutra lutra L*) The latter is very destructive to the mahseer and other fish in the large rivers and tanks It is possible that the clawless otter (*Aonyx cinera Illig*) which has been reported from Coorg by the Mammal Survey Party may occur in the confines of Mysore hills also Both otters are gregarious and live in burrows, on elevated grounds near water Family *Mustelidæ*

The sloth bear (*Melursus ursinus Shaw*) occurs in large numbers in the State and like other game is protected now The deep cavities formed by blocks of granitoid gneiss that weather on the hill sides are the favourite resorts of bears whose food consists of fruits both wild and cultivated insects and honey Tickell observes that Family *Ursidæ*

the power of suction in the bear as well as of propelling wind from its mouth is very great and is advantageous to the animal in procuring its common food, the white ants

Order *Insectivora*

The insectivores are a very primitive race of mammals, whose small size and nocturnal habits, must have helped their survival from past ages The large number (44) of generalized teeth and their tritubercular character point to their antiquity The Madras tree shrew (*Anathana elliotı Waterh*) resembles squirrels and inhabits trees The South-Indian hedgehog (*Erinaceus micropus Blyth*) whose occurrence in Mysore is doubtful, may perhaps wander into its confines from the borders of the British districts—Coimbatore and the Nilgiris The shrews are well represented in Mysore The brown shrew (*Pachyura murina L*) is an inhabitant of the woods and occasionally turns up in human habitations nearer their haunts. The grey musk-shrew (*P cærulea Kerr*) is not reported away from human dwellings, where sometimes it is seen in day time running close to the walls, making a peculiar squealing metallic sound It is quite serviceable in the house where it lives on cockroaches, scorpions, and other vermin and the charge brought against this animal of feeding on grain and vegetables is baseless Its usual haunts are the dark corners of book shelves, almirahs and boxes, frequently entering holes also The strong musky smell, characteristic of the domestic forms, is objected to by cats, who do not molest them Very little is known about the habits of the other shrews (*P perrotetı Duvern*) whose occurrence in Mysore is doubtful

Order *Chiroptera*

Bats are flying mammals and are most easily identified The elongated fingers and forearm include an expansion of the skin which also involves the hind limbs and the

tail The knee is directed backwards The sense of touch is developed in these animals to an incredible degree of perfection and is probably exercised by the nose frill the tragus of the ears and the wing membrane as well On the ground they are helpless, shuffling along awkwardly and when at rest they hang head downwards clutching by their hind feet branches of trees, crevices and holes in old walls and caves. Like the primates the female bats have only two pectoral teats The Indian fruit bat or flying fox (*Pteropus giganteus giganteus Brunn*) lives in large colonies and is most destructive to garden fruits The fulvous fruit bat (*Rousettus leschenaulti Desm*) is a cave haunting form which together with the Southern short nosed fruit bat (*Cynopterus sphinx Vahl*) is destructive to plantains guavas and mangoes The family *Rhinolophidæ* distinguished by a nose leaf, is represented by the genera, *Rhinolophus* and *Hipposiderus* the members of which occur both in forests and in human dwellings. The common names of the species the rufous horse shoe bat (*R rouxi Temm*), the great Indian horse shoe bat (*R beddomei And*), the little Indian horse shoe bat (*R lepidus Blyth*) the large Indian leaf nosed bat (*H lankadiva Kel*) Sykes leaf nosed bat (*H speoris Schneid*) and the bi-coloured leaf nosed bat (*H fulvus Gray*) are derived from the character of the nasal appendage. The members of the family *Nycteridæ* in addition to this character *viz* a leaf on the nose have their ears united at the base The large vampire bats (*Lyroderma lyra lyra Geoff*) frequent houses and the spoils of their foraging expeditions may be seen below their dwellings on the verandahs every morning The Malay vampire bat (*Megaderma spasma trifolium Geoff*) may also occur near about human dwellings The family *Vespertilionidae* which is by far the largest group may be distinguished by the occurrence of a tragus in the ear

and the absence of a nose leaf The Indian *Pipistrellæ* are rapid fliers, executing sudden twists and turns in the air, especially when hunting for insects Kelaart's *pipistrella* (*Pipistrellus ceylonicus Kel*) and (*P ceylonicus chrysothrix Wrought*) and the Indian dwarf *pipistrella* (*P mimus mimuns Wrought*), (*P coromandra Gray*) and (*P ceylandicus Dob*) are among the most common forms near about the houses The second and the third species frequently enter lighted rooms at night, where they fly about in quest of insects The winged termites, which come out in dense clouds after early summer showers, attract them in large numbers Like the *Pipistrellæ*, Dormor's bat (*Scotozous dormeri dormeri Dob*) and the common yellow bat (*Scotoptilus kuhli Leach*), (*S wroughtoni Thos*) and (*Myotis peytoni Wrought*) are insectivorous and leave their hiding places early in the evening But the most interesting member of the whole family is the painted bat (*Kerevoula picta Cantor*) which, as Jerdon says, is easily mistaken for a large butterfly in the day time It occurs in the whorls of the large stalks of plantain leaves and its bright colouration may have some protective significance *K crypta Wrought* is reported from Shimoga The family *Emballonuridæ* is not a wide one and the members belonging to this group have no nose leaf, but possess a tragus and the ears are united at the base The bearded sheath-tailed bat (*Taphozous melanopogon Temm*), (*T. kachensis kachensis Dob*) and the lesser Indian mouse-tailed bat (*Rhinopoma hardwickii Gray*) are among its representatives in Mysore *Tadarida tragata Dobson* and *Otomips wroughtoni Thomas*, are also known in the State

Order *Rodentia*

Among the members of the order *Rodentia*, are found species, which when they appear in numbers, become a destructive pest to the sustenance on which man lives The output of forest produce depends on the absence or

abundance of the squirrel tribe The South Indian flying squirrel (*Petaurista philippensis Elli*) which is nocturnal in its habits and other diurnal forms like the Coorg striped squirrel (*Funambulus wroughtoni Ryley*) the dusky striped squirrel (*F tristriatus numarius Wroughton*) which live on fruits nuts and berries practically carry on their work of depredation without let or hindrance One can easily imagine the extent of damage caused to forest revenue when one realizes the fact that except the palm squirrel (*F palmarum palmarum L*) all other species the common five striped squirrel (*F sublineatus Waterh*) and (*F palmarum bellaricus Wrought*) the Bombay giant squirrel (*Ratufa indica indica Erx*), the Coorg giant squirrel (*R indica superans Ryley*), the Central Indian giant squirrel (*R indica bengalensis Blanf*) the large Indian squirrel (*Sciurus malabaricus Erx*) and the grizzled Indian squirrel (*S ceylonicus Erx*) inhabit the densely wooded tracts, where besides denuding trees of their fruits, they make in them large holes as their breeding grounds Whatever may escape this process of destruction is sure to attract the attention of the members of the next family the *Muridæ* which comprise the true gnawers The Indian gerbil or antelope rat (*Tatera indica Hardw*) which makes several often deep burrows near cultivated tracts first begins with roots and grass and then proceeds to destroy the standing crops. The field rats and mice of which there is an appreciably large number in Mysore are of the same disposition and others are found in granaries, stores and houses, where besides grain they destroy frequently the garden produce as well The occurrence of the Indian bush rat (*Golunda ellioti Gray*) in Mysore is rather doubtful but this deficiency if it were so is more than compensated for by forms like the Cutch rock rat (*Cremnomys cutchicus Wrought*) the Malabar spiny mouse (*Platacanthomys lasiurus Blyth*) the

bandicoot rat (*Bandicota malabarica Shaw.*), the South Indian mole rat (*Gunomys kok Gray*), the Deccan tree mouse (*Vandeleuria oleracea Benn*), the white-tailed rat (*Epimys blanfordi Thos*), the common Indian rat (*Rattus rattus rufescens Gray*) and (*Rattus rattus wroughtoni Hinton.*), the South Indian field mouse (*Mus buduga Gray*), the common Indian house mouse (*M. mauei Kel.*), the long-tailed tree mouse (*M. badius Blyth*), the Deccan spiny mouse (*Leggada platythrix Sykes*), the Coorg hill spiny mouse (*L. grahami Ryl*), the Coorg lowland spiny mouse (*L. hannyngtoni Ryl*) and the Mysore leggada (*L. siva Ryl*). The Indian porcupine (*Hystrix leucura Sykes*) is abundant and, protected by an armour of quills, commits ravages among coffee and sugarcane plantations, besides being destructive to crops and garden produce, like cabbages, carrots, onions, potatoes, peas and fruits. The family of hares (*Leporidæ*) is represented by only two species, the common Indian hare (*Lepus ruficaudatus Geoff.*) and the black naped hare (*L. nigricollis Cuv.*) which inhabit waste ground or dry cultivation. They are more often netted than shot, sometimes coursed with hounds, when they take refuge in holes and burrows, not necessarily their own.

Order *Ungulata*

The members of the order *Ungulata* have hoofs instead of claws and their teeth are in the main adapted for a vegetable diet. All the modern survivals of this somewhat ancient race progress on the tips of their digits. The family *Elephantidæ*, some of whose extinct relations roamed over every part of the world from the Miocene to the Pliestocene times, is now confined to India and Africa. The vertical pillar-like legs, which characterize the elephants (*Elephas maximus L.*) must have developed as a secondary adaptive variation for supporting the enormous weight of the body. In Mysore, the movements of the herds are practically

confined to the districts of Mysore Hassan Kadar and Shimoga The repated intelligence and sagacity of the elephant are not borne out by the structure of the brain which rather suggests specialization of a low type while the massiveness of the skull is due to the formation of an immense number of air cavities. In India the elephant figures largely in folk tales and religious works and is an indispensable appendage to court pageantry and temple processions Mythologically the figure of an elephant represents the conception of eternity The figure of the elephant is a prominent feature of the Ganga dynasty of Kings of Mysore. Down to historical times the elephant has been part of the fighting forces of the country For an account of Keddah operations in Mysore the reader is referred to Section VII below

The family *Bovidæ* includes the hollow horned ruminants such as the ox sheep goat gazelle and antelope tribes. The Gaur or the Bison (*Bibos gaurus H Sm*) possesses as regards habits of life several points in common with the elephant. Their requirements in food and shelter being identical the same causes must influence the movements of both and according to the testimony of Sanderson they are frequently found grazing in close proximity without becoming intolerant of each other s presence Unlike the elephants however the gaur has never been noticed, at any rate in Mysore to venture into the open country, but practically remains concealed in the dense forest belts in the Malnad districts.

The Nilgiri wild goat or South Indian Ibex (*Capra warryato Gray*) which is an inhabitant of the rocky slopes of the South Indian hills may cross over the British frontier into Mysore district but is not reported as being common Blanford in describing the distribution of the *Nilgai* or *blue bull* (*Boselaphus tragoca melus Pall*) notes the occurrence of this tameable animal as far

as south of Mysore, though its abundance or even its occurrence in the State is more than doubtful. The same authority reports the occasional occurrence in Mysore of the four-horned antelope (*Tetracerus quadricornis Gray.*) which resembles the blue bull in keeping chiefly to undulating or hilly ground The genus *Antelope* is quite Indian and includes only one species *A Cervicapra L*), the Indian antelope or black buck, a name associated with the brown pelage turning black with age A tuft of hair on each knee is characteristic of the genus The females are generally hornless and those of the male vary as regards distance from each other and the number of spirals The gazelle may be distinguished by its smaller size and sandy colouration with a white belly Horns are present in both sexes and are of fair length with a lyrate form The Indian gazelle or Ravine deer (*Gazelle bennetti Sykes*) is far less gregarious than the antelope and loves waste lands broken up by ravines The power of the gazelle and of the antelope to live for a considerable time without drinking water is well-known though both are fond of fresh grass growing near the water margins

The family *Cervidæ* comprising the deer tribe is absolutely distinguished from the foregoing ruminant animals by the existence of solid horns or antlers which, however, are very variably developed among the several members, and they are with few exceptions confined to the males The Rib-faced or Barking Deer also known as Muntjac (*Muntiacus vaginalis Boddæ*), frequently erroneously called jungle sheep, derives its popular name from its well-known cry, which at a distance resembles the single bark of a dog The tongue of this animal is very long and extensible and in confinement, for instance, in the Mysore Zoo, may be seen cleaning the whole face with it The other name is due to a bony ridge which extends from the base of each of the short brow antlers,

converging towards the nostrils The buck is able to defend itself by its long sabre like upper canine tooth The Sambar or Rusa Deer (*Rusa unicolor Beche*) is perhaps the largest of the deer tribe met with in India The adult male is distinguished by long hair on the neck which form an erectile mane, and the orifice of the sub-orbital glands is very large In Mysore where it is principally a woodland deer it may be seen grazing on the fresh grass on the hill slopes after the early rains singly or only in very small parties The South Indian Spotted Deer (*Axis axis Erx*) which is much smaller than the Central Indian forms is the most beautiful in build and colouration and its favourite resort is bushes and trees near water courses or bamboo-jungles These forms are thoroughly gregarious and hundreds of individuals may sometimes be found in a large herd

The family *Tragulidæ* is distinguished by the absence of the foot and eye glands which mark off the foregoing family (*Cervidæ*) The Indian Chevrotain or Mouse Deer (*Tragulus meminna Erxl.*) which may be more appropriately termed Deerlet has several points in common with the pig rather than the true deer tribe Both sexes are *horuless*. The *feet possess four toes* which characterize the Soina and hence more primitive than either deer or antelopes and the organization of the stomach is intermediate between the pig and the ruminants. The Chevrotain is confined to the jungly districts in the State

The pig family, *Suidæ* is the least specialized among the Ungulates and judging from the fossil remains of the Indian Miocene and Pleistocene beds it must have been an extensive one including forms which unite the non ruminant pigs with the horned ruminants. The Indian Wild Boar (*Sus cristatus Wagn*) is a solitary animal found during the day in high grass or crops while the female and her litter as a rule associate in herds or

III Bird.

Introduction

The avifauna of certain places in Mysore, like the Bhadra valley in Kadur District, is both abundant and varied, and the occurrence of a large supply of insect and vegetable food all along the forests of the western portions of the State supports an equally rich wealth of bird life The classification of birds is still a moot point and the system adopted by E W Oates and W T Blanford is followed here

Order *Passeres*

The order of *Passeres* practically includes half the total number of the known species of birds and the family *Corvidæ*, perhaps, represents the most exalted

group of the entire division The crows are recognized by their black plumage and are distinguished from the *magpies* which possess a tail longer than the wing The common Indian House Crow (*Corvus splendens* Vieill) has a grey neck and the most obtrusive and clannish habits The prevailing belief in India that crows are one-eyed has no basis in fact and is probably due to their habits of tilting their head in one direction to gain a clearer view of the objects which may have excited their curiosity The Jungle Crow (*C macrorhynchus* Wagl) with a glossy black neck is found associating with the former species in towns and villages and the sexes in both forms are indistinguishable The House Crow in Bangalore breeds from the middle of April to June while the Jungle Crow breeds from January to March. The true Magpies (*Pica and Urocissa*) have not been reported from Mysore but their nearest relatives the tree-pies (*Dendrocitta*) are represented by the species *D rufa* Scop *and D leucogastra Gould* the former occurring in small bands in the level country while the latter is confined to forests Both forms are black with patches of white in *D leucogastra Gould* and they reach a length of 18 to 19 inches. The tits (Fam *Parinæ*) are comparatively small birds 5 to 7 inches long with an entire beak The white winged Black tit (*Parus nuchalis Jerd*) and the southern Yellow tit (*Macrolophus haplonotus Blyth*) occur in Mysore. They breed from May to September making a small nest of hair cotton and cocoanut fibres in holes of trees.

The sub-family *Crateropodinæ* which includes the laughing thrushes and babblers which are the most noisy and inquisitive birds is only poorly represented in Mysore The Wynaad Laughing Thrush (*Garrulax delesserti Jerd*) the Nilgiri and Banasore laughing thrushes (*Trochalopterum cachinnans Jerd*) and (*T jerdoni Blyth*) are fairly common in the hills The Babblers

the Southern Red whiskered Bulbul (*Otocompsa fuscicaudata Gould*) and the Yellow throated Bulbul (*Pycnonotus xantholaemus Jerd*) may be noted It is possible that *Micropus pharocephalus Jerd* may also be found in the borders along the Wynaad and S Coorg

The nut hatches which constitute the family of *Sittidæ* have as a result of their climbing habits developed a longer hind toe and their bills are adapted to catch insects and rend hard fruits like nuts. The Chestnut bellied nut hatch (*Sitta castaneiventris Frank*) and the Velvet-fronted blue nut hatch (*S frontalis Horsf*) which occur on the Wynaad borders generally frequent well wooded tracts both in hills and plains. The king crow or Drongo-shrike (*Dicrurus ater Herm*) is perhaps the most familiar bird of the family *Dicruridæ* which forms the best defined group of the *passeres* possessing a glossy black colour and a forked tail of ten feathers This bird has nothing in common with the crow whom however it will never hesitate to attack whenever disturbed The other Drongo (*D caerulescens L*) is met with in Mysore during the cold weather and perhaps migrates to the north of the Peninsula in the hot months The White bellied form is reported to have a rich oriole like note The tree creepers and the wrens of the family *Certhiidæ* are not represented in Mysore the warblers which comprise the large family *Sylviidæ* are sober suited comparatively small sized birds which migrate in some cases far and wide A great number of them are winter visitors to Mysore while a few remain in the plains in the hot weather, breeding between June to August. *Acrocephalus agricola Jerd* or the Paddy field Reed warbler is a winter bird and *A stentoreus Hempr & Ehr* may stay throughout the summer The Indian Tailor bird *Orthotomus sutorius Forst* which is a Wren Warbler is a permanent resident It is so called because it literally sews its curious nest with fibres and leaves.

About the monsoon time, when the breeding season for this bird commences, the cotton tree also bursts its pods and enables the bird to steal large quantities of cotton to stuff its nest with Another common warbler in Mysore is *Chaetornis bicustelloides Blyth*, which has a wide distribution and is known to change colour into a uniformly dull white during the nuptial season, generally after May, *Acanthopneuste lugubris Blyth*, stays only for a few months, summering in the higher parts of Sikkim The true Wren-warblers, like *Prinia jerdoni Blyth* and *P inornata Sykes*, are permanent residents which change colour during the pairing time These, together with *P. sylvatica Jerd* and *P socialis Sykes*, are the principal representatives of the family *Sylviidæ* in Mysore The Shrikes or Butcher-birds, which constitute the family *Laniidæ* are a group of quarrelsome birds, which resemble hawks in point of rapacity, though not in structure The Bay-backed Shrike (*Lanius vittatus Val*) is smaller than a Bulbul and is commonly seen perching on some prominent branch of a bush, catching insects either on the wing or on the ground The Rufous-backed Shrike (*L erythronotus Vigors*) which is also a permanent resident, is slightly larger than the previous species and has no white in the wings and tail and its rump is red The Black-backed Pied Shrike (*Hemipus picatus Sykes*) and the Malabar Woodshrike (*Tephrodornis sylvicola Blyth*) have the habit of fly-catchers, in feeding entirely on the wing and are by no means brightly coloured Both species breed in Mysore in March and April The common minvet of Mysore is *Pericrocotus flammeus Forster*, which with tit-like habits, is entirely arboreal and looks among leaves and branches for insects It may move in small flocks from place to place, though not commonly The White-billed minvet, *P erythropygius Jerd*, occasionally breeds in the hilly tracts in the months of July and August

Of the family *Oriolidae* comprising the Golden Orioles there are probably only two species common in Mysore viz. *Oriolus kundoo Sykes* and *O melanocephalus Linn* The note of the Indian Oriole is a rich mellow whistle which together with its beautiful yellow and a pink beak and eye ought to distinguish it from the black headed species which is less tastefully got up Both are fruit eaters occasionally catching insect larva They also associate with mynas in the peepul trees.

The Grackle family *Eulabetidae* is not an extensive one and its only representative in the forests of Mysore is *Eulabes religiosa Linn*, which is perhaps locally migratory The notes and power of mimicry of this species are only rivalled by the starlings and the mynas which comprise an equally restricted family *Sturnidae* It is doubtful whether any of the starlings belonging to the genus *Pastor* occur in Mysore but among the mynas are found *Sturnia blythii Jerd.* which is reported to breed in Mysore in April and probably the Grey headed Myna (*S malabarica Gm*) also They are arboreal feeding on Insects or sucking the nectar contained in flowers The Black headed Myna (*Temenuchus pagodarum Gm*) is a familiar bird distinguished by a black crest on the head and a rich buff coat This species like the common Myna (*Acridotheres tristis Linn*) is a ground feeder hunting for grasshoppers, for which they closely follow the heels of the grazing cattle From May to August both construct flimsy nests in the holes of the walls, or trees in the gardens, laying from three to five eggs of a pale bluish green. *A tristis* is kept as a pet and taught to speak The family *Muscicapidæ* comprising the fly-catchers are recognized by the presence of hairy feathers stretching over the nostrils and very feeble feet which disable them from walking on the ground A great many are migratory birds and among them may be mentioned the winter visitor to Mysore *Siphia parva*

Bechst Of the fly-catchers occurring in the plains, there are several species, belonging to the genera *Cyornis*, *Stoparola*, *Alseonax*, *Ochromela*, *Terpsiphone and Rhipidura* The Indian Paradise Fly-catcher *T. paradisi Linn*, is sexually dimorphic, the adult male has a glossy black-crested head, a white body and two white streamers on the tail, while the female provides itself with a chestnut suit, attracting little or no notice. The white-bellied blue Fly-catcher (*C pallidipes Jerd*) and Tickell's blue Fly-catcher (*C tickelli Blyth*) are met with in Mysore, where they are permanent residents The brown Fly-catcher (*A latirostris Raffl*) is a tiny little brown bird with the habit of sitting bolt upright, and with ceaseless movements of its tail It may be seen in the garden perching on the same twig from day to day The family *Turdiplæ*, composing the Chats, Blackbirds, Redstarts, Forktails, Thrushes and Robins, is a very large group of the *passeres*, but are poorly represented in Mysore The long feet possessed by the members of this family and the absence of hairy feathers over the nostrils serve to distinguish them from the Fly-catchers The common Chats like *Pratincola caprata Linn*, *P atrata Kel* and *P maura Pall* are permanent residents in Mysore and their breeding time is from February to June, when they construct somewhat flat primitive nests in wells or holes in the ground The Magpie Robin, *Copsychus saularis Linn*, and the Black-backed Indian Robin, *Thamnobia fulicata Linn*, are common in the gardens They have a habit of erecting the tail almost vertically and are groundlings collecting all manner of insects, but with no interest in fruits The Magpie Robin has a wonderfully rich and varied tone The Black Birds, *Merula nigripileus Lafr* and *M simillima Jerd*, are dwellers of thick woods on elevations, occasionally entering the gardens of travellers' bungalows The latter species resembles the English

Black Bird and its charming song is quite a feature of country life in Mysore But one must resort to the woods after the early showers in May if one desires to hear the melodious song of the Thrushes *Oreocincla nilgiriensis Blyth* and *Geocincla wardi Jerd*

In the family *Ploceidæ* are included the Weaver Birds (sub-family *Ploceinæ*) and the Munias (sub-family *Viduinæ*) which are gregarious in their habits and as grain feeders they are a nuisance to the raiyats. The Baya or the Weaver Bird *Ploceus baya Blyth* constructs an exquisite bottle shaped nest fixing it at the end of branches of trees generally overhanging water The nest is usually studded with clay balls which according to Jerdon, are used for steadying it if it should become lop sided but according to popular belief the male sticks fire flies on these soft clay masses apparently with a view to secure a brilliantly decorative effect for its dwelling The rim of the long funnel which is the passage to the nest, is not plaited, but is loose obviously with a view not to afford any firm hold to enemies like snakes. The Munias are the handsome tiny cage birds with red or black bills We have the Indian Red Munia *Sporæginthus amandava Linn*, and at least three species of the genus *Urolencha*, Jerdon's White-backed Munia (*U striata Linne*) is a black and white bird with a bluish beak and the Spotted Munia (*U punctulata Linn*) is of a rich brown colour, the underparts being white with stripes on the sides. The White-throated Munia (*U malabarica Linn*) is reported to be promiscuous in family matters laying eggs in the neighbours nest instead of its own Another family of gregarious birds also with granivorous or frugivorous habits are the Finches (Fam *Fringillidæ*) characterized by a stout bill which they use in husking grain The common House Sparrow *Passer domesticus Linn* is the best known member of the Finch family, whose

noisy presence near about the house is sometimes intolerable Sparrows build their nests in the ceiling generally or in holes in the walls The Yellow-throated Sparrow (*Gymnoris flavicollis Frankl*), though not common in populous towns, occurs in company with the House Sparrow in the country side, where like the house pest, it does not attach itself to man The Rose Finch (*Carpodacus erythrinus Pall*), is a winter visitor to Mysore, which it leaves about the middle of March The Red-Headed Bunting (*Emberiza luteola Sparrm*), may also be met with only as a stray winter visitor In the next family *Hirundinidæ*, comprising the Swallows and Martins, we return to insectivorous birds The common Martin, *Chelidon urbica Linn*, is reported from Mysore, where it breeds in the hot weather, while the Crag Martins, *Ptyonoprogne rupestris Scop* and *P concolor Sykes*, appear to be rare The Nilgiri House Swallow (*Hirundo javanica Sparrm*) which is plentiful in towns, flying up and down the long streets, constructs a cup-shaped mud nest in bungalows and out-houses The few that have established their home in the western verandah of the Zoological section in the Central College, Bangalore, breed annually between March and April Besides, *H erythropygia Sykes*, which is a resident of the plains, there is the Indian Cliff Swallow (*H. fluvicola Jerd*), occurring in abundance near the Jog Falls (Gersoppa) *H smithii Leach*, the Wire-tailed Swallow, is a winter visitor, found coursing the ditches of the streets or the grassy nullas and occasionally *H nepalensis Hodgs* may be met with in its company The nests of these migrants have been found along with those of the permanent residents The Pipits and Wagtails, constituting the family *Motacillidæ*, are groundlings and except the Pied Wagtail (*Motacilla maderaspatensis Gm*), nearly all other forms met with in Mysore are only winter-visitors, like *M melanope Pall*, *M borealis*

Sundev, and *M citreola Pall* They haunt cool shady places near water margins running between alternate steps preying upon all manner of small insects The Pipits wag their tails only modestly and among the permanent residents we have *Anthus nilgiriensis Sharpe* and among the winter visitors to the plateau of Mysore we have *A maculatus Hodgs* —the Indian Tree Pipits The former species keeps to the highest points of the hill ranges in the State The Indian Skylark *Alauda gulgula Frankl*, belonging to the family *Alaudidæ* is one of our song birds frequenting corn fields and grassy plains from which they are however driven by the extensive employment of manure which they detest The only other species definitely known to occur in Mysore is *Mirafra affinis Jerd* the Madras Bush lark about whose habits little is known The Purple Sunbird *Arachnechthra asiatica Lath*, of the family *Nectariniidæ* is common in our gardens flitting from flower to flower extracting the nectar hidden in the calyces This species is the smallest of our garden birds and builds a small cup-shaped nest in the bushes, where two or three grey eggs are laid chiefly in the cold months The purple-Rumped Sun bird *A zeylonica Linn.* and probably also *A minima Sykes* occur near about the gardens. In the gardens of the hill stations in Mysore, like the Nandi hills the Flower Pecker *Dicæum concolor Jerd* is common, dwelling in the foliage of trees They are as tiny as restless and to watch them steadily for a few minutes in their haunts is by no means easy The Pittas, family *Pittidæ* are insectivorous groundlings hopping and running with great facility The Indian Pitta, *Pitta brachyura Linn* is a solitary representative in Mysore, with local migratory instincts.

Order *Pici*.

According to Blanford, the order *Pici* contains the single family of Woodpeckers *Picidæ* while Evans and

Gadow combine a series of bird families with complicated relations under *Coraciiformes*, which coincides with the *picariae* of Nitsch and Sclater The little scaly-billed Green Woodpecker, *Gecinus striolatus Blyth*, is a fairly common bird in the wooded tracts of Mysore It does not perch among the branches of trees, but moves about over the bark in a series of jerky movements, pausing now and then to hammer at the trunk for caterpillars, which may have burrowed into the wood It is curious that in whatever direction the Woodpeckers may be moving, they hold the head upwards, propping the body on the stiff short tail The most familiar species of Woodpecker in the State is the Golden-backed three-toed form, *Tiga javanensis L jung*, which in Bangalore breeds about March, laying two or three elongated white eggs in a rudely constructed nest of leaves in the holes of trees The other species, which are equally common in the cocoanut groves and topes, are *Iyngipicus hardwicki Jerd* and *I gymnophthalmus Blyth* and the occurrence of large forms like *Chrysocolaptes festivus Bodd*, *C guttacristatus Tick* and *Thriponax hodgsoni Jerd* in the evergreen forests of the Malnād tracts is more than probable

Order *Zygodactyli*

The barbet family, *Capitonidæ*, is not numerously represented in the State The common Green Barbet, *Thereiceryx viridis Bodd* and possibly *T zeylanicus Gm* are residents of groves far from towns, but the most familiar example is the Coppersmith or Crimson-breasted Barbet, *Xantholpema hæmatocephala P L S Mull*, whose dull monotonous call, *tonk tonk tonk*, uttered in a wearisome manner but at regular intervals is common experience in Bangalore in March and April

Order [illegible]

The Rollers (Fam *Coraciidæ*), Bee-eaters (Fam *Meropidæ*), Hornbills (Fam *Bucerotidæ*), King fishers (Fam *Alcedinidæ*), and Hoopoes (Fam *Upupidæ*)

constitute the order *Anisodactyli* and modern ornithologists are not quite agreed as regards the affinities of these several families The Indian Roller *Coracias indica Linn.* with its blues and brownish rufous, is the common bird perching on the telegraph wires which one sees from the train and it leaves the villages and cultivation for the wooded tracts during the breeding season from March to May The occurrence of *Eurystomus orientalis Linn* the Broad breasted Roller, within the State is only exceptional. The Indian Bee-eater, *Merops viridis Linn* is the representative of the family *Meropidæ*, to be seen from the end of the rains to the beginning of the hot weather, disappearing in the interval for the purpose of breeding

The Pied Kingfisher *Ceryle varia Strickl* is common on all rivers and tanks and hovering about ten or fifteen feet above the water drops vertically on its prey uttering a sharp twittering cry in the meantime Equally common near the waters is *Alcedo ispida Linn*, not much larger than a sparrow, though of a most irritable temper The beautiful White breasted Kingfisher (*Haleyon smyrnensis* L) and the Stork billed Kingfisher (*Pelargopsis gurial Pears*) have a coral red bill the latter species is common in Malnād tracts, near about all streams. None of these brilliantly coloured birds have a musical note their cry being a harsh guttoral twitter The Hornbills, *Lophoceros birostris Scop* and *L. griseus Lath* are not uncommon visitors to the forest belts of Mysore Their heavy bills and the habit of the male among them walling up the female bird from before laying her first egg till the young are about a week old are well known. It is a long step from the Hornbill to the Hoopoe (*Upupa indica Reich*) a bird about the size of myna with a long slender, curved bill and a coronal crest This species is a permanent resident, which together with the winter visitor *U epops Linn* is well known for the habit of

probing the ground for ant-lions and other subterranean grubs

Order *Macrochires*

There are five species of Swifts (Fam *Cypselidæ*) in Mysore. Two of these, *Cypselus melba Linn* and *Chaturia Indica Hume*, are among the fleetest of birds, capable of flying 100 to 125 miles per hour The Indian Swift, *Cypselus affines Gray*, is common in old temples, where they construct nests composed of feathers, grass, twine, rags and wool The Swifts have all the toes pointing forwards and can only cling but not perch like swallows *Chætura sylvativa Tick*, the White-rumped Spine-tail, is a forest species common on the southern borders of Mysore district, where the Indian edible nest 'swiftlet', *Collocalia fuciphaga Thunb*, occurs in the hill ranges The presence of feathers and straw in the nests makes them rather inedible The Nightjars or Goatsuckers, as the generic title *Caprimulgus* expresses, are nocturnal, insectivorous birds about the size of pigeons Franklin's Nightjar, *C monticola Frankl*, Horsfield's Nightjar, *C macrurus Horsf*, and the Jungle Nightjar, *C indicus Lath*, are chiefly forest birds, while *C asiaticus Lath*, occurs in the plains, chiefly in uncultivated open country All these species lay their eggs, two in number, of a pale solomon pink or stone colour, on the bare ground in the hot season

Order *Coccyges*

The sub-family *Cuculinæ*, comprising the Cuckoos, is biologically the most interesting group From March to July most of them remain in the plateau of Mysore, while some continue in it even in the colder months Curiously they are "heard rather than seen", their power of mimicry and their extraordinary habits of parasitism in foisting the duties of rearing their offspring on other birds are well known The Common Cuckoo (*Cuculus canorus Linn*), which breeds between April

ond June resembles a sparrow hawk which is dreaded by birds like robins wagtails pipits and bushchats On the appearance of the male cuckoo in the neighbourhood of these little birds they join together in defence of their homes and proceed to buffet the intruder, who draws them away from their nests, into which the female cuckoo taking advantage of the absence of their rightful owners slips her eggs Soon after hatching the young foundling proceeds to eject the offspring of its foster parents from the nests so as to appropriate to itself all the supply of food to which it has absolutely no manner of right The Common Hawk cuckoo or more often known as the brain fever bird (*Hierococcyx varius Vahl*) also strikingly resembles the shikra (*Astur badius Gm*) It is a permanent resident but heard only from March to July and Jerdon describes its call more as a loud crescendo, something like 'Pipeeha pipeeha each repetition higher in the scale This species victimises the babblers who rear its progeny The manner in which the Cuckoos deposit their eggs in the nests of other birds is one which has engaged a great deal of attention It used to be supposed that the eggs were laid in the normal way in the nest of the birds selected as foster parents and this may be occasionally so but the more frequent method is as pointed out by Bainbridge Fletcher and Inglis for the egg to be laid and then carried by the Cuckoo in its bill and dropped into the nest selected for the purpose. The unusually thick texture of the cuckoo-egg shell seems to be specially adapted to this end as, in cases where the nest is placed inside a hole the egg may have to be dropped into it from a little height In the case of Hawk cuckoo it is possible that its hawk like appearance on the wing may be advantageous in securing a clear field for depositing an egg in this way in the nest of the Seven Sisters or some allied species of Babblers as one observer states

that the whole sisterhood makes itself scarce when the Hawk-cuckoo appears on the scene, and thus give her a fair field for planting her oval imposition on them The Plaintive Cuckoo (*Cocomantis passerinus Vahl*), common in the groves and gardens, selects the nests of wren-warblers and bulbuls while the Drongo-cuckoo (*Surniculus lugubris Horsf*) which is somewhat rare, resembles the Drongo-shrike (*Dicrurus ater*), thereby obtaining access to the nests of its model The pied Crested Cuckoo (*Coccystes jacobinus Bodd*) resembles a magpie and is far more savagely attacked by crows than even the koel (*Eudynamis honoratа Linn*), which is the bird of the Indian poets It is a black bird of the size of a crow and is frequently called the 'brain-fever bird', a name perhaps due to the fact that its cries become more persistent as the temperature becomes warmer from March to July The house crow (*Cervus splendens*) and the jungle crow (*C macrorhynchus*) play the foster parent to the young koel The Coucal or more popularly known as Crow Pheasant (*Centropus sinensis Steph*) is a black bird with straight hind claw, occurring in cultivated and waste lands It is a cuckoo that is trapped or netted by the wild tribes in Mysore like Sholigas and Kurubas who prize its flesh This species makes its own nest, breeding about the month of June

Order *Psittaci*

The parrots by their docile and amusing habits, bright plumage and capacity to stand confinement, have been the most favourite of all birds They are characterized by certain striking features like the movement of the upper beak and zygodactyle feet The commonest Indian Parrot (*Palæornis torquatus Bodd*) is seen flocking in the evening on the peepul tree along with the crows and mynas and is the most destructive to fruit gardens This parrot builds its nests towards February in the holes of the walls of temples and houses in the extensions in

Bangalore. *P cyanocephalus Linn* the western Blossom headed Paraoqnet and the Blue winged Paraoqnet (*P columboides Vigors*) are forest species visiting the open cultivated tracts after the rains. Specimens of the Indian Loriqnet (*Loriculus vernalis Sparrm*) reported from western Mysore are only cold weather visitors, occasionally met with in the fruit gardens after the rains.

Order *Striges.*

The owls have a position midway between the parrots and the *Accipitres* or birds of prey and are distinguished by the reversible outer toe two large eyes looking forward uncommonly large ears a parrot-like beak, and peculiarly soft feathers Some of any rate of these characters are associated with their nocturnal habits, which together with their dismal cries, must account for the popular belief that they are birds of evil omen The little spotted Owl (*Athene brama Temm*) with its semi diurnal habits, is the familiar bird whose noisy jabber near about the houses is a nuisance. Perching on electrical wires, these owlets get a rich feed of winged termites which gather in dense clouds round the street lamps This species roosts and breeds, from March to May, in the roofs of the houses in the extensions in Bangalore. More thoroughly nocturnal and therefore less familiar is the Barn owl (*Strix flammea Linn*) which establishes its home in the deserted temple old walls and forts. They were formerly common in the extensions in Bangalore and the present writer has noticed them swooping, from their perches on telephone wires, on mice which come out in the dark to pick gram from the droppings of horses on the streets. This species is less dreaded by the superstitious folk than the great Fish-owl (*Ketupa zeylonensis Gm*) whom the prospect of food may sometimes attract to the neighbourhood of human dwellings and its loud and ghostly cry

'Ghoo-Ghoo-Ghoo', far reaching without being localized, combined with the weird stillness of the night must produce a terrible effect on weak nerves This owl is as fond of mice and other small mammals as any other species of its tribe Among the Wood-Owls confined to the hill forests, may be mentioned the Brown-owl (*Syrnium indranı Sykes*), possibly the mottled form *S ocellatum Less* and the Eagle Owl (*Huhua nepalensis Hodgs*) Their habitat, large holes in trees and crevices in rocks, and their shy disposition do not favour their being seen

Order *Accipitres*

The diurnal birds of prey which constitute this order are a strikingly marked group, with a raptorial bill, powerful talons, strong and sustained powers of flight and the long nest occupation of the young. The Vultures are a bald-headed and bare-necked family, with perhaps a single genus, *Neophron*, represented in Mysore The White Scavenger Vulture, *N ginginianus Lath*, is common about towns and villages and the other forms are *Otogyps calvus Scop*, the Pondicherry Vulture, *Gyps indicus Scop*, the Long-billed Vulture and *Pseudogyps bengalensis Gm* the White-beaked Vulture The great majority of other raptorial birds, like hawks, kites, falcons, harriers and eagles, which comprise the family *Falconidæ*, differ from the vultures in having their neck and head decently clothed and never given to foul-feeding The only two eagles likely to occur in Mysore are Bonelli's Eagle (*Hieraetus fasciatus Vieill*) and possibly the Black Eagle (*Ictinaetus malayensis Reinw.*) The first species is destructive to pigeons and some of the bolder members may carry off even large-sized chicken Legge's Hawk-eagle, (*Spizaetus kelaarti Legge*) is confined to the hilly tracts, while the white-eyed Buzzard-eagle, *Butastur teesa Frankl*, keeps very much to the open plains, building a crude nest of sticks in the mango trees

The Brahminy Kite, *Haliastur indus Bodd.*, and the Common Kite, *Milvus govinda Sykes* are the familiar country side birds The Black winged Kite *Elanus caeruleus Desf*, occurs only rarely in the western outskirts of the State. The Harriers *Circus macrurus Gm* and *C cinereaceus Montagu* which are our cold weather visitants, scour the country during their sojourn for quails munnias mynas and incautious mammals of small size. The Shikra *Astur badius Gm* is easily known by its flight which consists of a few rapid strokes of the wing and then a gliding movement and is a terror to small birds like sparrows and bulbuls The Crested Goshawk *Lophospizias trivirgatus Temm* is a hill forest shikra of doubtful occurrence in Mysore and the Sparrow Hawk *Accipiter nisus Linn* may take its place which for sheer boldness and swiftness of attack excels birds of larger size The falcons do not resort like hawks to surprises but fairly hunt down their victims in the open air Doubtless the Peregrine Falcon *Falcon peregrinus Tunstall* flies over Mysore in the cold weather but the Laggar Falcon *F jagger Gray* is a permanent resident, striking down all manner of smaller birds chiefly pigeons. *Tinnunculus alaudarius Gm* is the Kestrel or the wind hover a name which it derives from its habit of hovering in the air before alighting on its food of lizards, mice and frogs and is a great lover of open grassy plains.

In the order *Columbæ* we have a group of birds like Pigeons and Doves which are either grain or fruit-eaters The South Indian Green Pigeon (*Crocopus chlorogaster Blyth*) occurs in flocks wherever the banyan and peepul trees abound. *Osmotreron affinis Jerd.* the grey fronted green pigeon, like the foregoing species is a forest haunting example easily approached and shot. In all rocky cliffs and old deserted buildings and sometimes when encouraged, in towers of mosques, are found large flocks

Order Columbæ

of Blue Rock-pigeons (*Columba intermedia Strickl*) which are the parents of all the commonest varieties, like tumblers, pouters and fantails, which the fancier has produced The Nilgiri Wood-pigeon (*Alsocomus elphinstonii Sykes*) which keeps to the hill-forests of the Malnād tracts, is quite as large as a fowl Of the Doves, that which is most often seen in Mysore is the spotted species (*Turtur suratensis Gm*), which can be recognized by its reddish wings spotted with dark brown and pale buff The Indian Turtle-dove (*T. ferrago Eversham*) is not at all, and the little Brown dove (*T cambayensis Gm*) only too frequently, met with in the bush jungle and trees about cultivation It is doubtful if the Red Turtle-dove (*Oenopœlia tranquebarica Herm*) occurs within the confines of the State

Order *Pterocletes*

Like Pigeons and Doves, the Sand or Pigeon-grouse is a lover of hard seeds and is monogamous Blanford reports the occurrence of the painted sand-grouse (*Pterocles fasciatus Scop*) in Mysore and this is perhaps the only representative of this somewhat restricted order in the State

Order *Gallinæ*

The members of this order are most varied and are represented in Mysore by the common Pea-fowl, *Pavo cristatus Linn*, the grey Jungle-fowl, *Gallus sonnerati Temm*, the Red Spur-fowl, *Galloperdix spadicea Gm* and occasionally the Painted Spur-fowl, *G lunulata Valenc* They are shy birds confined to wooded ravines near water and bamboo jungles Living habitually among hedges and bushes, is found in little flocks the Bush-quail (*Perdicula asiatica Lath*) all over the forests and hills The Grey Quail (*Coturnix communis Bonn*) is a cold weather visitant and all along the Ghats the Painted Bush-quail (*Microperdix erythrorhynchus Sykes*) occurs The White-painted Partridge, *Francolinus pictus*

Jerd and the Grey partridge *F pondicerianus Gm*, affect cultivated tracts

Order *Hemipodii.*

The order of *Hemipodii* has been created to receive the three-toed quails and throughout, unlike the foregoing order the female birds are bigger and in a few species are more brightly coloured They lead a solitary life in grassy plains and do not fly till actually endangered, when after a short flight drop again whence they can be very seldom flushed a second time The Button Quails belonging to the species *Turnix pugnax Temm.* the Bustard quail and rarely *T dussumieri Temm* the little Button Quail are the only representatives in Mysore

Order *Grallæ*

The only common forms representative of this order are the Blue-breasted Banded Rail *Hypotaenidia striata Linn* and the Ruddy Crake *Amaurornis fuscus Linn* which love swampy places and bamboo jungles where owing to their skulking habits, they are occasionally heard rather than seen The Brown Crake *A akool Syke.*, though a moorhen rather than a rail can swim in water quite as well as run on land and the true moor hen *Gallinula chloropus Linn*, is only an occasional visitant to the large swampy areas in the Malnad belt. Among the cranes haunting the tanks or rivers, we notice *Grus communis Bechst*, which as the specific name indicates is a gregarious bird like the Demoiselle Crane *Anthropoides virgo Linn* The Great Indian Bustard *Eupodotis edwardsi Gray* frequenting wastes covered with low grass in the dry open country, is one of the largest game birds often weighing 25 to 30 lbs, and distinguished by its peculiar deep booming note The Florican *Sypheotis aurita Lath* breeds and lives in high grass or growing crops and is a permanent resident of the Mysore State.

Order *Limicolæ*

Swamps, river-side and stony plains are the favourite haunts of the members of this group The Stone Curlew, *Oedicnemus scolopax Gm* and the Stone-plover, *Esacus recurvirostris Cuv*, are met with in undulating ground, the former is well known for its trick of lying down on the ground when pursued, when detection becomes difficult The Courser (*Cursorius coromandelicus Gm*) is as common on the sandy tracts of the State as the Bronze-winged Jacana, *Metopidius indicus Lath*, near about tanks overgrown with water reeds Among the Lapwings and Plovers, we may note the occurrence of the Red-wattled Lapwing, *Sarcogrammus indicus Bodd*, and some species of Sand Plovers (*Aegialitis*) The sportsman's "Snippets" are either the common Sandpipers (*Totanus hypoleucus Linn*) or the Wood Sandpiper (*T glareola Gm*), or the Green and Red Shanks belonging to the same genus Other water birds which are our cold weather visitors are the Woodcocks, *Scolopax rusticula Linn*, and the Snipes, *Gallinago* The former is a nocturnal feeder and is rare in Mysore. The Pintail Snipe, *G stenura Kuhl*, and rarely *G caelestis Frenzel*, the Fan-tail Snipe, predominates in Mysore in season

Order *Gaviæ*.

The River-tern (*Sterna seena Sykes*) and the Black-belted Tern (*S melanogaster Temm*) are common Mysore river-birds, frequently met with near large tanks and marshes also

Order *Steganopodes*

No breeding ground of the Spotted-billed Pelican (*Pelecanus philipensis Gm*) has been discovered in Mysore and the Cormorant visiting, either singly or in flocks, the rivers and tanks within the State is *Phalacrocorax javanicus Horsf* The commonest of the diving fishers is the Indian Darter or Snake-bird, *Plotus melanogaster Penn*

Order *Herodiones.*

The members of this order are marsh lovers and resemble the Cranes and *Limicolæ* in having long bills necks and shanks It is doubtful if any *Ibis* is met with in Mysore where, however the Black necked Stork (*Xenorhynchus asiaticus Lath*) frequents the river margins of the Cauvery the Thnnga and the Bhadra. The Herons, belonging to the genus *Ardea* are un common while the Egret *Bubulcus coromandus Bodd* is met with in large nnmbers in company with the Pond Heron *Ardeola grayi Sykes* The latter is essentially a paddy bird fond of cultivation or ponds which hold frogs and crabs It is probable that the black Bittern *Dupetor flavicollis Lath*, occurs within the confines of the State

Order *Anseres.*

The web-footed birds ducks, geese and swans form this well marked order The Swans (*Cygnus*) are not reported from Mysore The Comb Duck or Nukta *Sarcidiornis melanonotus Penn* is common near about marshy tanks with reedy margins where as an occasional visitor the Pink headed Duck *Rhodonessa caryophyllacea Lath*, may also be met with The migratory Brahminy Duck or Ruddy Sheldrake, *Casarca rutila Pallas* occurs in cold weather near the sandy banks of all the rivers in Mysore. Abont weedy ponds we have the Whistling Teal *Dendrocygna javanica Horsf* the Cotton Teal *Nettopus coromandelianus Gm* and occasionally the spotted billed dnck *Anas poecilorhyncha Forst* which offer excellent sport at all times Among the migratory ducks which are sometimes met with about October to March may be mentioned *Nettium crecca Linn* the Common Teal and *Dafila acuta Linn* the Pintail

IV Reptiles

Introduction

Reptiles are cold blooded scaly animals which breathe by lungs. A fairly tropical climate and a rich supply of

insect food support quite an abundance of reptilian life within the State Their mode of occurrence is correlated with their structure, some inhabit the rivers and tanks, a few are entirely arboreal, others dwell in the underground burrows or lead a subterranean life A great majority of reptiles are nocturnal in their habits, while others that venture to hunt for their prey during the day time, trust for their safety either to their speed or effective concealing powers In regard to their classification and nomenclature, Dr G. A Boulenger is followed

Order *Emydosauria*

The Marsh Crocodile or the "Mugger," *Crocodilus palustris Less*, flourishes in abundance all along the Bhadra and the Cauvery, and being naturally a timid animal, has not been known to molest man or animals in his service, except under grave provocation

Order *Chelonia*

There is no mistaking a tortoise in which the long retractile neck and legs act as a piston for respiratory purposes The soft shelled family *Trionychidæ* is represented in the Mysore rivers by the species *Trionyx leithii Gray* and *Emyda vittata Peters*, both of a pugnacious temperament The family *Testudinidæ*, which is a wide one, contains two forms occurring commonly within the State, *viz*, *Testudo Elegans Schoep* and *Nicoria trijuga Schweigg*, both of terrestrial habits, living in the grassy jungles at the base of the hills The only other form that may possibly occur in the Cauvery is *Kachuga lineata Gray*

Order *Squamata*

Lizards, skinks, monitors, chameleons and snakes comprise this comprehensive group Among lizards possessing cylindrical digits, we may mention the occurrence of genera like *Gymondactylus* and *Gonatodes* Examples such as *Gym nebulosus Bedd*, *Gmy*

albofasciatus Boul Gon mysoriens Jerd Gon indicus Gray and *Gon wynadensis Bedd* are inhabitants of moist sub-tropical forests of the Malnad districts with diurnal habits. On the slightest approach of danger they retreat under stones or disappear in a heap of dead leaves Geckoes, with dilated digits possessing adhesive structures underneath the toes constitute the common genus *Hemidactylus* most members of which possess a voice from which the superstitiously disposed persons draw all manner of prognostications About eight species of this genus can be mentioned as occurring in Mysore and in the villages with a rank scrub jungle all round *H frenatus Dum and Bibr H gleadowi Jerd H leschenaultii Dum and Bibr* and *H coctaei Dum and Bibr* are met with as house Geckoes They are mainly nocturnal in their habits but in places rarely frequented, like forest or inspection bungalows, they may be seen running about the floor and walls in day time. Like *H reticulatus Bedd. H triedrus Daud.* is a Hill Gecko with young ones which are curiously striped H *leschenaultii Dum and Bibr* is not infrequently met with on the peepal tree the bark of which completely harmonises with the colour of this Gecko ' The tail of all these forms is the weakest point of their structure and if dismembered is soonest regenerated The extraordinary twitchings of the snapped appendage in the claws or jaws of the pursuing enemy must be the only defence of these harmless lizards which having thus drawn the attention of the captor to the less vulnerable part, escape into their retreats with their body intact

In the family *Agamida* we find mostly arboreal laterally compressed forms which possess eyes provided with lids and a differentiated dentition. The Flying Dragon *Draco dussumieri Dum and Bibr* an inhabitant of the hill forests uses the lateral expansion of skin as a parachute in supporting its mid air leaps from tree

to tree The sexes in this lizard differ The ground long-limbed Lizard, *Sitana ponticeriana Cuv*, occurs throughout the State, the male during the breeding season developing a coloured gular sac The Tree Lizard, *Salea horsfieldii Gray*, is rather rare in Mysore and the next genus *Calotes* is, however, widely represented A crest of dorsal spines running from the neck downwards will distinguish it at once The commonest member is *C versicoldr Daud*, the males of which species are the larger and become brightly coloured in the nuptial season This lizard and its relatives have the habit of nodding their head when alarmed Other species occurring in the State are *C nemoricola Jerd*, *C ophiomachus Merr* and *C elliotr Gunth*, which are met with both in the plain country and in the woods All the Tree Lizards are diurnal in their habits and are insectivorous *Charasia dorsalis Gray* and *Ch. blanfordiana Stol*, are Rock Lizards with a depressed body, occurring at all elevations. The male of the latter species has a red head and a black body, limbs and tail during the pairing period People in the country-side report the occurrence of a lizard which can expand its body and is dreaded by them for its "poisonous qualities" It is possible that this lizard is the S Indian Monitor (*Varanus bengalensis Daud*) which is nocturnal in its habits, and is said to attain 2½ ft, exclusive of the tail The true lizards (Fam *Lacertidæ*) may be distinguished by the presence of symmetrical shields on the head, the skin of the body being devoid of osteoderms The two genera *Cabrita* and *Ophiops* are represented in Mysore by *C leschenaultii M Edw*, *O jerdonii Blyth* and *O beddommi Jerd*, haunting arid waste lands In the former species, the lower lid of the eye possesses a large transparent "window," which in the latter, is permanently welded to the aborted upper lid, an adaptation for protection against sand in which they live In the skink, of the genus

Varuna one of the group of the next family *Scincidæ* for example in the form *V. Carinata Schneid.* the lower eyelid is considerably enlarged and covers the whole eye when it scuds along or hides in sand. *M. beddomii Jerd.* is another example of skink, with red or scarlet tail met with in Mysore. In the other group of skinks *Gen. Lygosoma* of which there are about four species which inhabit sandy situations and have burrowing habits, the body is elongate and the limbs poorly developed. The Chameleon *Chamæleon calcaratus Verrem.* (Fam. *Chamæleontidæ*) known for its power of changing the colour of its skin, is the most specialized among the lizards and is a dweller of the wooded tracts. Its digits arranged in groups of two and three, its clutching round tail, the long projectile range of its tongue and the independent action of the eyes are some of the adaptations which the animal has developed as a result of arboreal habits.

Snakes are only lizards which have lost their limbs and girdle bones chiefly owing to gliding motion and to habits of insinuating themselves into holes and they have also a specialized swallowing apparatus by which they can swallow prey much larger than the girth of their own bodies. A poisonous snake differs from the non poisonous form in possessing a gland which secretes the poison conveyed by a duct to a grooved or canaliculated tooth called a fang. There is no external criterion by which one can tell, except through a wide and intimate acquaintance with the ophidian life, a poisonous species from an innocuous form and an examination of the dentition is the only basis of determination. The burrowing families *Typhlopidæ* and *Uropeltidæ* are a most primitive race in that they possess, like the *Boidæ* remnants of pelvic bones and must have taken to subterranean life very early in the course of the evolution of the Ophidia. There are three species of Typhlops *T. braminus Daud.*

T beddomii Blgr and *T acutus Dum and Bibr*, occurring in the State and they are all worm-like burrowing creatures The other family, *Uropeltidæ*, is represented by several species of the genus *Silybura* and one of the genus *Melanophidium* The Boas in Mysore are the rocksnake, *Python molurus Linn*, *Gongylophis conicus Schneid*, a comparatively inoffensive snake which Boulenger describes as of a "fierce temper," and the burrowing snake *Eryx Johnii Russ* It is possible that *Xenopeltis unicolor Reinw* may also be found The *colubrinæ* which are fangless (Aglypha) are an inoffensive group like the foregoing and species belonging to the genera *Xylophis*, *Lycodon*, *Abalabes*, *Oligodon*, *Zamenis*, *Coluber*, *Dendrophis* and *Tropidonotus*, constitute the main ophidian life in the State *Lycodon aulicus Linn* is a striped snake which turns up in houses and the useful role it plays by destroying the vermin in the house is usually forgotten in dealing with it It simulates the colour of the deadly Krait The rat snake, *Zamenis mucosus Linn*, is another example which suffers for imitating the Cobra and no greater friend of humanity suffering from rat pests really exists *Dendrophis pictus Gm*, the palmyra snake, is a typical arboreal form, which by energy and aggressiveness, makes up for lack of poison. *Tropidonotus stolatus Linn* is the common grass snake and *T piscator Schneid* is the pond and river snake and *T plumbicolor Cantor* is the thick green snake met with in old brick heaps or mounds of earth The group *Dipsadinæ* possess a fang in the rear of the upper jaw, and hence constitute the series Opisthoglypha and the genera *Dipsas*, *Dryophis* and *Cerberus* are represented by a few species *Dryophis mycterizans Daud* is the common green whip snake, which is popularly believed to strike the eye Its green colour, harmonizing with the foliage amidst which it lives, is an example of protective colouration *Cerberus rhynchops Schneid*, which

lives in the marshy portions of the Cauvery has none of the gentle disposition attributed to it by certain authors. The sub-family *Elapinæ* (Series Proteroglypha) comprises the most deadly species like the Krait Cobra and Coral Snakes. The common Mysore or S Indian Krait (*Bungarus Cæruleus Schn*) rare because of its shy disposition is recognized by the dorsal median row of hexagonal scales which are larger than the neighbouring ones. The latter are fifteen around the body These characters coupled with a blackish or bluish black ground colour with transverse white bands, would be sufficient diagnosis The scales underneath the tail are undivided One ought to look to the scalation and teeth instead of colour for identification As widely prevalent as the Krait, is the Cobra *Naja tripudians Merr* whose hood and spectacle mark ought to be sufficient to identify this species. The Coral Snakes, easily recognized by the red on the under surface of their body are confined to the hill tracts where the common form is *Hemibungarus nigrescens Gunth Callophis trimaculatus Daud* is a rare snake in Mysore The open groove of the fang of the *elaphinæ* becomes a closed canal in the family *viperidæ* (Solenoglypha) which includes the Daboia or Russel's Viper (*Vipera russellii Shaw*) whose magnificent scheme of colour is a sufficient means of identity

Russel's Viper grows to about four feet in length It is considerably thicker than the cobra, though it is of sluggish habits. Daboia, Krait and Cobra are most destructive to human life and cattle. The saw scaled viper *Echis carinata Schneid* common in Mysore is recognized by the carinate scales on the flank and a cruciform white mark on the head It rarely exceeds two feet in length but is very fierce and venomous. The Pit Vipers, or sub family *Crotalinæ*, are represented in the Malnâd area and the hill forests by species like *Ancistrodon hypnale Merr*, the Hump-nosed Viper,

Trimeresurus (Lachesis) anamallensis Gunth, T strigatus Gray and *T gramineus Shaw* The *Crotalinæ* may attain a length of three to four feet in some cases and inflict furious bites setting up severe constitutional disturbances, but these do not generally lead to a fatal termination

V. Amphibians

Introduction

As a class the amphibians are less numerous than any of the foregoing groups and fishes Biologically they are interesting from the fact that several features of their internal organization disclose a piscine descent and in turn they have been the ancestors of reptiles Most members of the phylum pass through an interesting stage of larval development, at which the young possess both gills and lungs, which are however permanent only in some of the primitive orders

Order *Ecaudata*

The tail-less four-footed Batrachians, like Frogs and Toads, constitute this order and the family *Ranidæ* is the most comprehensive one The green tank frog, *Rana hexadactyla Less*, inhabits situations which do not dry up in the hot weather This and its near relative *R tigrina Daud*, or the Bull Frog, attain a very large size There is more than one variety of this latter species in Mysore, *e g*, *R tigrina (var) crassa Jerd* The commonest form which sometimes visits the street gutter is *R cyanophlyctis Schneid.*, which is a concert-giving frog All these three species have a habit of running or jumping over the surface of the water as on land, when alarmed. In the paddy fields and near about the adjacent watercourses occurs a green frog known as *R limnocharis Weigm* and after a heavy shower of rain, a fat member of the same genus, *R breviceps Schneid*, comes out in the night to breed in the improvised pools and disappears before morning This is a powerful digger In the

Malnād tracts the chief representatives of this tribe are *R curtipes Jerd*, easily recognized by its grey back and black sides and limbs and *R leptodactyla Blgr* The hill forests contain *R dobsoni Blgr R beddomii Gunth R malabarica Dum.* and *Bibr* and *R temporalis Gunth* An equally large genus is *Rhacophorus* which includes the channam frog *Rh maculatus Gray* met with in the plantain trees and occasionally on the walls of houses. This species and its relatives *Rh pleurostictus Gunth* and *Rh malabaricus Jerd.* construct a kind of parchment nest for the reception of their eggs The enormously large black tadpoles met with in shoals in the tanks and rivers in the Malnad districts are the young ones of *Rh pleurostictus* The hill forests are the head quarters of a race of tiny frogs of the genus *Ixalus* The larvæ of some species of this genus resemble the young ones of the foregoing genus and in both genera the adults have digits which possess discs with which they can cling to vertical surfaces The commonest members, of about half a dozen species of this genus which can be noted in Mysore are *I variabilis Gunth* and *I glandulosus Jerd* Other genera with similar discs are *Micrixalus* and *Nyctibatrachus* and we find forms like *M saxicola Jerd*, *M fuscus Blgr* and *N Major Blgr* near the shady mountain streams of ever green forests or *kans* A new variety *N sanctipalustris modestus Rao* is recorded from Shimoga.

The family *Engystomatidæ* is characterized by a narrow toothless mouth and possesses a digging apparatus on the heel. They are thoroughly terrestrial and leave their places some of them at any rate only after very heavy showers The one whose cry is loudest is *Cacopus systoma Schneid* It is common in the plain country The male has a very large vocal sac *Microhyla rubra Jerd* which has a stout habit like the preceding species is rare. *M ornata Dum and Bibr* is the

most widespread example of the whole family Large shoals of transparent tadpoles with flagellate tail seen in the tanks between the months of May to October belong to this frog The cry of the two *Microhyla* is a low whistle *Kaloula variegate Stolic.* is met with in the ant-hills and produces a low plaintive voice "qhuay," "qhuay," uttered at regular intervals, from a direction which also changes as the listener turns this side or that. *K obsecura Gunth* and *K triangularies Gunth* are other species with similar habits, found in Mysore Another extremely little frog, new to Science, *Ramella symiotica Rao,* has been recorded from Bangalore

The toads, Fam *Bufonidæ*, also toothless, are terrestrial forms, with a dry warty skin A bean-shaped gland on either side of the neck is more or less prominent The thick musky humour secreted in this gland confers on toads immunity from all enemies except the cobra The house toad, *Bufo melanostictus Schneid*, which is the largest of the Indian toads, may be seen towards evening greedily swallowing the winged termites, which leave their burrows in dense masses or enjoying a bath under the tap It enters the tank during the breeding season, and lays eggs in double strings round about the grass and weeds near the margin The young ones, which are extremely tiny, leave their hiding places and come out in thousands soon after the rains, thus accounting for the popular belief that "it has rained frogs" *B fergusonii Blgr* and *B microtympanum Blgr* are other forms found in the open country and *B parietalis Blgr.* and *B pulcher Blgr* are confined to hill forests The toads in the fruit gardens do excellent service by destroying earthworms and all noxious insects

Order *Apoda* The limbless batrachia are worm-like burrowing animals restricted to the dense moist hill forests, about whose habits practically nothing is known Five species

belonging to the three genera *Ichthyophis Gegenophis* and *Uraeotyphlus* are known from S India and it is likely that *U Oxyurus Dum* and *Bibr* is found in Mysore possibly also *I glutinosus Linn I carnosus Bed U malabarica Bed* and *U menoni Annand*

II *Fishes*

Introduction.

The river Cauvery with its principal affluents like the Lokapavani, Shimsha Arkavati Lakshmonathirtha and Kabbini the Thunga and the Bhadra the Sharavati and numerous smaller streams which form the upper reaches of the Pennars and the Palar together with some of the magnificent artificial tanks abound with excellent fish

Order Ichthyophis

The Cat-fishes so called because of the barbels fringing the mouth, form the well known family *Siluridae* most members of which inhabit the tanks where in the hot weather the waters become both muddy and foul *Clarias batrachus Linn* (the Anai meenu of fishermen) so called because of its amphibious life is the most common fish whose flesh is considered nourishing and invigorating *Saccobranchus fossilis Bloch* (Thela meenu) is prescribed for convalescents for its nourishing qualities and is equally amphibious. Its pectoral spine is dreaded by fishermen as causing poisonous wounds. *Wallago attu Bloche.* and *Schneid.* (Balai meenu) inhabits rivers and tanks where it is most destructive to the smaller species. This predaceous form is said to attain 6 feet—four foot specimens are common and are good eating All these are foul feeders. The Butter fish (also known as Pafta) *Callichrous bimaculatus Bloch* is greatly prized for its fine qualities and the larger tanks and rivers abound with it. Another fish equally liked for its excellent qualities is the Lady fish, *Pseudotropius atherinoides Bloch*, inhabiting the bigger tanks *Macrones* (Jella) is

common in tanks and rivers and is employed as food by the poorer classes though the fish itself is of inferior quality *M vittatus Bloch* (Jella) is a small species, but extremely common According to Day, this fish is called "Fidler," because it is supposed to make a noise when irritated Its musical power is, however, limited to a whirring noise which it can produce. The irritable temper attributed to *vittatus* enables them to attack fish of larger size The fishermen dread the pectoral spine of *M cavasius H B* (nar jella) and prize *M aor H B.* a three-foot specimen of which was recently obtained from the Thunga *M punctatus Jerd* (Sholang Kellatte) is common in the Cauvery and *M oculatus Cuv* has been taken from the Kabbini Both these forms are netted when the river is low, and brought to the market in numbers *M keletius C and V* is a form familiar in the Thunga river, from the same source may be obtained *Rita hastata Val*, which is believed to live out of its element for a long time, thus permitting its being carried in a fresh condition over long distances. Poorer classes eat this fish It is likely that *Bagarius yarrelli Sykes* is found in the large rivers of Mysore According to Day, it takes a live bait but is difficult to kill Partly because of its size and veracity and partly because of its under-hung mouth, this form is often termed a fresh-water shark The genus *Glyptosternum* is adapted for a life in rapid streams, by the development of an adhesive apparatus on the under-surface of the body The species *G lonah Sykes* and *G madras-patanum Day*, which occur in the Cauvery and the Bhadra, are never in demand on the market

The Carps, Fam *Cyprinidæ*, differ from the Cat-fishes in possessing a toothless mouth They both constitute the main fish fauna of our tanks and rivers The Loaches (Marlu Meenu) are the principal destroyers of mosquito larvæ and being small, are usually angled

for *Lata sp* obtained from the Thunga is likely to prove new to science and *Nemachilus thys sp* (named *Shimoga jerdoni Day*) taken from the same source may be another new species *Pseudecheneis thermalis C and I* is, like the genus *Nemachilus* the commonest loach. There are nearly half a dozen species of *Nemachilus* of which the most familiar forms are *N arcuatilis Mar B beavani Gunth B denisonii Day* and *N pulchellus Day* all known from Shimoga. It is likely that *Homaloptera* or Stone Carp may occur in the Thunga and the Bhadra. The stone-sucker *Pseudecheneis sulcatus* or *Garra lamta H B* (Pandi jakka or Kathi korika) is adapted by its ventral sucker for a life in rapids and the forms inhabiting the tanks show a degeneration of this adhesive apparatus. This is a foul feeder and is the food of the poorer classes. There are at least more than two new species and one new local race of this fish in Mysore. Two new species of Garra *G bicornuta Jerd* and a new variety of *G jerdoni brevicephala Jerd* have also been found in the State. The group *Labeo* derives its name from the thickened tuberculated lips continuous at the angle of the mouth and to some extent resembles the snout of the suinae hence the Muhammadans do not touch this and the previous genus. *Garra Labeo calbasu H B* abounds in tanks where it is essentially a bottom feeder and fairly popular in spite of its numerous bones *L potail Sykes L kontius Jerd* (Handi kurlu) *L boggut Sykes L boga H B* (Mada kurlu) and *L ariza H B* are some of the examples met with in the rivers and most of these are common on the markets of Mysore and Shimoga. *Cirrhina* and *Scaphiodon* both known as Aruju are not esteemed as food except by the poorer classes. *C Cirrhosa Bloch C reba H B* and *S breviceps dorsalis Day* and probably also *S nashii Day* inhabit tanks and rivers where they are baited and netted. It is not certain if *Catla catla H B*, which is greatly

esteemed, is found in the Cauvery, where forms like *Ambly pharyngodon melettina C and V* (paraga) and possibly *A mola H B* are equally common Yedatore, Chunchankatte and Ramnathapur are famous for *Barbus* (Pakke) and some of the brilliantly coloured forms are found in the Cauvery and the limpid water of Moti Talab (Pearl Tank) The Sharavati contains forms which exhibit great individual variations, chiefly in the examples taken above and below the Fall Over twenty-two species of this wide genus occur in the State and the "mahseer," *Barbus tor H B* from Sharavati is justly famous like *B. neilli Day*, from the Thunga and the Cauvery The fishermen employ the term "pakki" in a generic sense and its application to forms like *B. sarana H B* (Gid pakke), *B parrah Day* (Pith pakke) and so forth, has reference to particular features like size, colour or edible qualities The paraga or paraga pakke of fishermen is *Puri* (*Esomus*) *danrica H B*, which abounds in all ponds and tanks and as a surface feeder is a valuable agent in destroying mosquito larvæ Perhaps equally useful in this direction is *Rasbora daniconius H B* (Jubbu) common in garden wells and irrigation wells and irrigation channels *Rhotee neilli Day*, *R cotio H B* and *R Ogilbi Sykes*, which rarely exceed 5-6 inches, are not esteemed as food except by the more indigent classes They are common in the Thunga The occurrence of *Danio* in Mysore is more than probable The genus *Brachirus*, represented by at least two species *B bendirisis H B* and *gatensis C and V Chela* (Kende Meenu), occurs in greater profusion, at least six species being known The individuals of several species of the genus obtained from different sources vary widely and examples like *C argentea C and V* (White carp), *C clupeoides Bloch* and *C bacaila H B* are in some demand in the local markets

The herring family, *Clupeidæ*, is marine but experiments

on *Clupea ilisha H B* the Hilsa (*palaia meenu*) ought to be of more than ordinary interest to a State like Mysore with its rich network of broad rivers

The two species *Notopterus Pallas Blanor or Knife Fish* and *N chitala H B*, which represent the family *Notopteridæ* (walka thattai) thrive in great profusion in the larger tanks and rivers and in spite of numerous bones they are greatly esteemed as food *Chitala* attains four feet and this and other species are extremely wary in taking a bait

The family *Cyprinodontidæ* is represented by the tiny little fish *Haplochilus melanostigma McClell and* frequently entering the inundated paddy fields. This form is a surface feeder and is an effective agent in the destruction of mosquito larvæ The colour of this species varies according to the surroundings from which it is obtained It is probable that *H lineatus C and V* also occurs in Mysore. *Belone cancila H B* (kale holaya) belonging to the family *Scombresocidæ* occurs in our rivers but is not greatly esteemed as food Its elongated toothed jaw is used by the barber surgeon for opening wounds and ulcers.

The order *Acanthopterygii* is largely marine except for a few species of the genus *Ambassis* and some other families. *A nama H B* and *A ranga H B* are common in the rivers of Mysore and both species vary either with age or with the surroundings in which they live It is more than doubtful if *Nandus nandus H B* occurs in Mysore But two species of the family *Rhynchobdellidæ Mastacembelus pancalus H B* and *M armatus Lacep* (havoo meenu) are found in rivers and tanks The latter example attains more than two feet and the body is cylindrical or eel like. It is prized as excellent food especially when it comes from the rivers. Members of the family *Ophiocephalidæ* coming from the

Order Acanthopterygii

same source, *viz*, rivers, have an equal value About half a dozen species of *Ophiocephalus* (Murrel or snake-heads) inhabit the rivers and tanks within the State They are amphibious and can live outside the water for a considerable time, and their breeding habits are interesting They construct a crude nest in the clearings of coarse grass or rushes near the weedy margins of tanks and are strictly monogamous The young of some forms like *O striatus Bloch* are brilliantly coloured with orange and those of *O punctatus Bloch* have a metallic band across the body They breed twice in the year almost corresponding to the two monsoons The true murrel, *O marulius H B* (marua), is common in Shimoga and both *striatus* and *puntatus* (kuchu meenu) are plentiful in Bangalore *Oleucopunctatus Sykes* (soovala or hoovu meenu) and *O. gachua H B* (Korve) are known from Mysore The former species, which attains nearly three feet, commands an excellent market The occurrence of *Polyacanthus cupanus C and V* (thabutte) Fam *Labyrinthici*, in the Mysore rivers, is more than doubtful, but at least two species of the genus *Etroplus* of the family *Cichlidæ*, often designated as Chromides, inhabit Mysore *E suratensis Bloch* (bachenake meenu) easily takes a bait Larger forms of this species grow a foot or more, and afford excellent eating

VII Elephant Kheddahs

Pit method

The pit method of capturing elephants in Mysore on a wide and systematic scale owes its origin probably to the failure of Hyder Ali in his operations in the Kakankote Forests to surround and secure large herds, which in his time must have proved valuable military adjuncts The presence of pits in Ainurmarigudi, Methikoppe Veeranhosahalli and Chamarajnagar State Forests in Heggaddevankote, Hunsur and Chamarajnagar taluks

bears testimony to the popularity of this system It continued to be employed in an organized manner up to 1898 The number of elephants captured during the period between 1878 and 1898 is reported to be 138 which is certainly a large prize. The system in vogue of catching elephants was not an elaborate one Pits were artfully disposed along routes frequented by wild elephants or near about the pools and trees which they love to visit and being lightly covered over by a network of bamboos, leaves and earth were speedily overgrown with grass after the early showers so as to remove all causes for suspicion The excavations (usually 10½'×7'×12') were purposely made tight fittings to prevent the captives from digging in the sides and make a way out It is astonishing, that animals usually so cautious saw nothing to rouse their suspicion and precipitated themselves into the pits damaging their limbs or receiving some permanent internal injury The Sholigas and Kurubas who generally supervised these operations visited the pits both in the morning and evening during the elephant season usually after the monsoon and carried the news of the fall to the base camp where the tame elephants were stationed When the captive elephants fairly completely filled the pits there was no space in which to throw fodder and there was absolutely no means of watering them and the period which elapsed between the fall and the rescue was usually one of starvation for them After noosing the captive with the help of the *Kumkies* (or tame elephants) the pits which by now would be slightly enlarged by the struggles of the captive beasts were filled in with twigs leaves and other rubbish with the result that the animals elevated themselves automatically Sometimes as in British India, the pit was as a precautionary measure surrounded by an improvised stockade which however was usually dispensed with

This is but a general outline of a method which, on account of the cruelty involved, is very rarely resorted to in Mysore at the present day, still flourishes in South India and Malabar, with such variations in the details of operations as local conditions may call for, but in all cases usually attended by unspeakable horrors

Kheddahs

The earliest reference to the Kheddah operations in Mysore is the unsuccessful campaign organized by Col J L Pearse in 1866-67 in the Kakankote forests, not far from the site of the present Kheddah The failure of his attempt would appear to be due to the inexperience of the men with whom he had to deal, the occurrence of an accident which scared away the herd and the arrival of hot weather, which forced the elephants of these parts to take shelter in S. Coorg, Wynaad and the bases of the Nilgiris By employing the method prevalent in the Government Kheddah Establishment in Bengal, the late Mr G P Sanderson successfully planned a campaign, which resulted in 1874, in the capture of a herd of fifty-three elephants, which had escaped the operations of 1873 The system consisted in surrounding the herd or herds in their covers, on information being brought to the hunters by the party of trackers, who were sent early in the season to locate them By establishing a guard of sentry all round, it was impossible for the herd to break through, for all attempts on the part of the enclosed captives to approach the ring of patrol would be met by shouts and noises from which they promptly retired During the day time, when the elephants gave no trouble, a few men would be drawn from the watching line to construct the Kheddah in the enclosure itself The Kheddah, or the ring stockade, was placed on one of the beaten paths frequented by the herd in the surround, and two diverging wing stockades or funnel would lead out from the drop down of the Kheddah On the

completion of the construction leaves and branches of trees were used in screening the posts and gates. Once the herd was set on this track the funnel into which they were continually driven from behind and from the flanks led them to the gate, which they were forced to enter by shouts and blazes of fire behind The door of the Kheddah was then dropped by cutting a small cord which secured the controlling rope and the *Kumkies* or tame elephants were then entered into the stockade to help in roping the wild captives.

Mysore system.

The Mysore Kheddah system differs from the Bengal method in several points. The herd is driven from long distances till finally the elephants enter by one of the gates, a large enclosure (Kheddah) protected by a deep trench all round except at the entrances. The funnel leading out from one of the gates and the roping enclosure with a platform from which to witness the roping operations are constructed later Herds may also voluntarily enter the Kheddah

The following table shows the number of Kheddahs in the State —

Taluk	Kheddah	Remarks
Chamarajnagar ..	1 Karadibalia ..	Not used.
	2. Neelkurgi	
	3. Boothepadaga	
Nanjangud	4. Naganpur	Not used.
Heggaddevankote. ...	Kakankote—	
	5 Number I Kheddah ..	
	6. do II do ..	
Shimoga	7 Sakrebyle	
Narasimharajapura	8. Hebbe	Not used.

Statistical table of captures

The following table shows the number of captures made in the several operations since 1894, and the amounts realized from the sale of elephants —

Year of Operation	Captures	Casualties	Number Sold	Number Disposed of otherwise	Amount Realized
					Rs
1894-95	57	12	45		38,245
1895 96	33		26	7	23 032
1896 97	170	52	79	39	82,990
1897-98	27		23	4	27,235
1905-06	87	8	58	21	64,165
1909 10	92	13	61	17	1,07,505
1911 12	22	4	18		27,575
1913-14	109	32	66	11	1,25,250
1917-18	33	4	9	20	14,950
Total	630	125	385	119	5,30,947
Average	70	14	43	13	1,379 approximately

The average price of an elephant would be, according to the above total, Rs 1,379 About 60 per cent of this amount would be the cost of operation, calculated on a single head, and 20 per cent the cost of maintenance, till the elephant is put on the market, assuming that any of the old Kheddahs, with such repairs as they may need, are used in the capture

In Mysore, the operations are generally undertaken to provide relief to the harassed raiyats, whose cultivation is destroyed by the elephant, or they may be ordered to provide entertainment to distinguished State guests Some of the elephants captured on these occasions are reserved for the use of the Palace and the Forest Department

VIII Game Law

(*a*) General Outlines

The Mysore Game and Fish Preservation Regulation

The necessity for a Game Law having been pressed upon the Government by both planters and sportsmen, principally to prevent the indiscriminate destruction of

useful species of animals and birds, Regulation No II of 1901 was passed on 8th April 1901 The legislation is based both upon humane and utilitarian considerations, inasmuch as it does not attempt to extinguish the immemorial rights of the people to kill game for food or sport or to create any monopoly in animals and birds in a state of nature for the benefit of Government or of sportsmen. To secure the due propagation and perpetuation of useful species of game and fish the Regulation provides for the protection of such species with reference to time place sex growth manner of killing and the implements of destruction It also empowers the Government to afford absolute protection to specified insectivorous birds and to animals and birds whose killing would be unsportsmanlike or viewed with popular disfavour By rules framed under the Regulation, the killing of animals and birds for the commercial value of their skins and plumage has been regulated by means of a system of licenses or prohibited altogether in the case of particular kinds of animals or birds either for a certain time or within a certain area

Fishing in any stream or tank has in like manner, been controlled together with the poisoning of the water the use of explosive or other deleterious substances thereon and the capture of fish by fixed engines and nets of a mesh below a certain size

A season in the year has been fixed for the killing or capture of game or fish and the killing has been prohibited absolutely as regards both mature specimens and the young of either sex of specified descriptions of game

By Section 12 of the Regulation a general exception has been made in the case of an owner or occupant of land who may kill capture or pursue game doing damage to any growing crop

(*b*) Definition of "Game"

The term "Game," as defined in Section 2 of the Regulation, means antelope, ibex, jungle-sheep, sambhar and all other descriptions of deer, bison, hares, jungle-fowl, spur-fowl, pea-fowl, partridge, grouse, quail, wood cock, bustard, florican, duck and teal and includes such other animals and birds as may be notified by Government to be "Game"

(*c*) Penalties under the Regulation and the Rules thereunder

Every offence against the provisions of the Regulation and the Rules thereunder, is punishable by a fine not exceeding Rs 100.

Elephants (Madras Act No I of 1873).

Madras Act No I of 1873, extended to the Mysore State, in May 1874, prohibits, subject to the exception noted below, the destruction of wild elephants, whether on Government property or not Wild male elephants may be destroyed (*a*) on private estates by the proprietor or a person authorized by him, (*b*) on waste or forest lands, the property of the Government, by a person holding a license issued by the Deputy Commissioner under rules framed by Government

The license is tenable for one year after the expiry of which, unless renewed, it becomes void. Conviction for an offence under the Act entails forfeiture of the license

The Act does not *prohibit the destruction* of wild elephants, male or female, found upon cultivated lands or in the vicinity of a public road, nor does it prevent any person from destroying a wild elephant, male or female, in defence of himself or any other person

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CHAPTER VI

ETHNOLOGY AND CASTE

Pre historic races.

LITTLE definite is known of the earliest inhabitants of what is now the Mysore State Stone monuments found in various parts of the State point unmistakably to the existence in pre historic times of races of people about whom we have still to learn much Until a proper pre historic survey is undertaken and carried out we have to rest content with the scanty glimpses we can get of them from the researches of the few investigators who have so far unearthed their remains Palæolithic man in Mysore as elsewhere in Southern India, was comparatively speaking a rude personage His remains mostly chipped stone implements, have been found embedded in Pleistocene deposits Among the places where these have been found in the State are —Isaradi Gudda near Banavar Talya in Holalkere Taluk Jyankal in Hosdurga Taluk, Nidaghatta near Sakropatna, Kadur Taluk Lingadahalli, Tarikere Taluk Nyamati Honnali Taluk Biramangala Goribidnur Taluk Hiriyur and Kaldurga Tarikere Taluk. Among the finds have been sharply pointed oval, adze shaped and spear headed palæoliths, half drilled stones celts and reddle stones ground on two sides and flakes The people who made and used these rude implements must have died out of a low stage of culture. They appear to have been followed at a long distance of time by another race whose remains are also to be found in the State These are the people of what is termed the Neolithic Age They are represented by implements and weapons (in much greater form and variety) made by chipping and subsequently grinding and polishing suitably hard and tough stones.

The art of making pottery had been discovered as also that of drilling stone and other hard materials. The tools used in preparing implements, both warlike and industrial, were still predominantly stone ones Of the places where remains of this age have been found in the State are West Hill, French Rocks, Seringapatam and Srinivaspur in the Kolar District Among the objects made by Neolithic man are celts, hammer stones, corn crushers, etc From the very few specimens of this age unearthed in the State, it is clear that much remains yet to be done in the matter of a systematic survey of the kind already suggested The direct descendants, probably of the Neolithic people, were the people of the Iron Age, whose remains are found widely scattered over the State In this age, stone implements were almost entirely displaced by iron ones, the art of iron smelting having been discovered and the use of iron implements having, from their great intrinsic superiority and the far greater facility of their manufacture, spread very rapidly Wheel-made pottery had come into general use, and many other metals besides iron had begun to be worked The arts generally made great advance during this period Among the places in the State in which remains of this age have been so far found are the following —Srinivaspur, Kolar District, North Bank of the Cauvery opposite the Nara-sipur Sangam, Lakshampura on the Cauvery, Holakal Hill, Sira Taluk, Banvali, Channapatna Taluk, Talya, Holalkere Taluk, Kotigehar, Mudgere Taluk, Jala near Bangalore, Anaguttahalli, Mysore, Savandrug, etc There is no reason to believe that the Neolithic man of Mysore differed much from his brethren outside of it in Southern India From the remains he has left behind, we gather something of his culture, the fashion of his garments, the kind of ornaments he wore, the arms and implements he carried and the animals he domesticated, chased or worshipped Among the domestic animals he

know were probably the following —buffalo cow sheep horse elephant, dog and perhaps also pig and goat Among wild animals he knew the leopard sambhar doe jungle fowl bustard and perhaps also tiger bear bison monkey snake and cobra He indulged in decorating the horns of his buffalo Apparently buffaloes and sheep were made to look pretty with garlands and bells Much of the pottery he made and used he ornamented with figures, from which most of our knowledge about him is derived The idea of property in movables was possibly developed in him for we find his pottery containing something like ownership marks Among the arms borne by him—some of those found in Mysore are figured by Mr Bruce Foote in his *Pre historic Antiquities*—are short handled axes swords daggers and maces. Perhaps he also knew the spear and the bow and the arrow His dress was by no means elaborate He was evidently indifferent to the rigour of the high plateau climate Both men and women wore head dresses of various shapes, mostly peaked caps with the summits hanging forward more or less In some cases so much as to resemble closely the classical Phrygian cap On their bodies they appear to have worn no clothes except waist cloths worn quite narrow These clothes were of varied patterns ringed spotted, striped or chevroned Neck laces with or without pendants were commonly worn by them also elaborate cross belts both fore and aft. Bracelets armlets and anklets were worn equally commonly by them It is possible that they practised tattooing The hair of the head was worn with very little show There are no indications that women wore either ringlets or chignons. The men wore their beards clipped rather short but they were apparently of thick growth. The pottery articles used by them were many and some of them striking either for their form or the elaborateness of their decoration The commonest articles appear to

have been bowls, vases, saucers, lotahs, burial troughs, ringstands, discs, perforated vessels, platters, etc Among uncommon articles of pottery found in Mysore may be mentioned seed-boxes used in sowing grains and other small seeds, and what appears a libation cup which is a piece of black polished ware of funnel shape, with a perfectly flat, though small, base

Their relation to the modern population

How are these pre-historic races connected with the people now found living in Mysore? Are the people of to-day the descendants of the older races who lived in this part of India? These are difficult questions to answer until a thoroughly satisfactory pre-historic survey of the whole of the State has been, as suggested, carried out From the little that is now known of the older races, it is altogether impossible to say if there are any descendants of Palæolithic man in the present day population of Mysore.

Three primary ethnic elements in the modern population

Mr Bruce Foote inclines to the view that, while Palæolithic man has, so far as is now known, left no representatives, Neolithic man was the ancestor of the Iron Age man, from whom the present inhabitants of Southern India are in their turn descended The evidence of Ethnology leads to the conclusion that the present population of Southern India—including Mysore—is made up of at least three primary elements —

(1) Pre-Dravidian including the forest and hill tribes (under which head would come the Irula, Kadu Kurubas, the Sholigas and the Kadu Gollas of the Mysore State) and forming a population entirely distinct from the Dravidians who form the bulk of the population,

(2) Dravidian, and

(3) Aryan

There has been much speculation as to who these Pre-Dravidians are and when and how they reached their present habitat Similarly in regard to the Dravidians,

opinion is still divided as to whence they came from and when As regards the Aryans, their descent into the south and the extent of the influence they exerted on the people amidst whom they settled are still matters of keen discussion among the learned

Anthropometry as a test of race

This broad threefold division of the present population has been the result of a systematic Anthropometric and Ethnographic Survey carried out in Southern India, including Mysore, during the past twenty years or so This survey was inaugurated at the request of the leading anthropologists in Great Britain by the Government of India in 1901 soon after the Census of India of that year In accordance with the general plan then adopted the survey was extended to Southern India including the Native States in it The survey included not only a systematic enquiry into the Ethnography of each of the major castes but also a detailed examination from an anthropometric point of view of their physical characters. While the ethnographic portion of the survey in Mysore was conducted by the late Mr H V Nanjundayya M.A M L, C I E the anthropometric part of it was carried out by Mr Edgar Thurston, C.I E, who was also responsible for similar work in the rest of Southern India. The defects arising out of a plurality of people undertaking work of this kind were thus avoided and all possible accuracy was thus sought to be attained As in what follows, the information gathered and the results arrived at by Messrs Thurston and Nanjundayya and also by Mr Ananthakrishna Iyer, who carried out the Ethnographic Survey of the State of Cochin, will have to be referred to and in some respects depended upon it seems necessary to add that the deductions drawn from them should be treated as by no means final The work of the examination—physical lingual and ethnographic—has only been just begun and much remains yet to be done

before anything like satisfactory data can be made available for drawing scientifically accurate conclusions on the subject of the racial origins and the distribution of races that are now found to inhabit Southern India Recent criticisms have shown a tendency to discredit to some extent the deductions drawn from the physical study of man as he is in the south of India It has been urged, for instance, that the number of subjects chosen for measurement have been far too few to make the results arrived at unassailable "Dr Thurston's data," writes a recent critic, "are defective, because he has not carefully recorded the localities and the endogamous groups to which his subjects belonged Both these points are of supreme importance Then, again, the number of subjects measured, especially in some of the larger communities, is nothing like enough I would suggest, too, that a few more criteria be added, *e g*, the facial angle, the length of the upper arm and forearm, etc" In another place, the same critic, comparing Professor Risley's examination of over 25 million subjects with the work done in India, remarks "In the whole of India, Mr. Thurston's investigations, as recorded in his *Castes and Tribes*, total a little less than 3,000, a splendid achievement for a single-handed effort, but considerably less than one in 10,000 The number of subjects dealt with in Risley's *People of India* is not quite 12,000, or about one in 24,000 of the total population (in 1901) of 294 millions It cannot, therefore, be said that the Anthropometric Survey of India has been exhaustive or adequate, and the data available are seriously defective in that little count has been taken of sub-caste and locality, two factors of immense importance"

The main indigenous castes and tribes and their racial affinities

In the present state of our knowledge, however, all that is possible here is to briefly indicate the results so far achieved by the Ethnographic and Anthropometric

Surveys which have been at work in Mysore and the adjoining areas The geographical position of Mysore has rendered it possible to be influenced by ethnic influences of a varying kind In the north west it has been open to inroads of immigrants from what is now the Southern Mahratta country on the north east by people from the semi Telugu Districts of Bellary Anantapur Cuddapah and Kurnool on the east by people from the semi Tamil Districts of North Arcot South Arcot Chittoor Salem and Trichinopoly on the south by people from the semi Tamil Districts of Coimbatore and Nilgiris which is occupied by people speaking languages allied to Tamil Malayalam and Kannada and on the west by people from the District of Malabar the Province of Coorg and the Districts of North and South Kanara. Mysore has in its turn sent out waves of emigrants into most of the districts we have noted above Straggling Kannada speaking castes are to be found as far south as Madura and Dindigal the latter of which was once a Mysore possession in Chinglepat close to Madras in H E H the Nizam's Dominions and on the west, as far as Poona and nearer home in Coimbatore and on the Nilgiris The Badagas are both physically and linguistically a race of settlers from Mysore their name (Badaga) indicating the northern direction from whence they emigrated to their present abodes. The language they speak is not so much an organized dialect of Canarese as Dr Caldwell puts it as 'an ancient or rather a mediæval form of it Dr Caldwell considers Kota the language spoken by the Kotas of the Nilgiris a very old and very rude dialect of Canarese which was carried thither (the Nilgiris) by a persecuted low caste tribe at some very remote period Opinion is divided as to the original abode of the Todas of the same hills. Dr Rivers the latest writer on them thinks they reached the hills from the Malabar country But

there is still ample ground for assigning to them a Kannada origin Dr. Pope, who wrote a grammar of their language, says that "their speech sounds like old Canarese spoken in the teeth of a gale of wind The language seems to have been originally old Canarese and not a distinct dialect The Todas were probably immigrants from the Canarese country, and have dwelt on the Nilgiris for about 800 years" Mr. Rice, the Editor of the first and the revised editions of this *Gazetteer*, wrote connecting them with the Hale Paikas of the Nagar Malnad of this State

Out of thirty-four dominant castes and tribes described by the Mysore Ethnographic Survey, seven are essentially Kannada in origin, twelve Telugu in origin but long resident in the State, two Tamil but settled in the State from time out of memory, eight were apparently originally Telugu, but now are partly Telugu and partly Kannada, speaking the prevailing language of the area in which they are found, one is sub-divided into sections speaking Kannada, Telugu or Tamil, one is partly Kannada, and partly Tulu, one is entirely Mahratta in origin, and one speaks a language which is a mixture of Mahratti and Guzerathi In the castes in which a linguistic division prevails, sometimes the division is so well marked that no intermarriage is allowed between the two This is the case among Madigas and Gollas, among whom the Kannada and Telugu speaking sections hold no connubium with each other On the other hand, among the Upparas, who are obviously an immigrant caste, though there are sections in it speaking Telugu and Kannada, these freely intermarry. Most of the castes and tribes found in Mysore are also to be found in the adjoining British districts of Madras, and though occasionally, as notably in the case of Tiglas, they may go by a different name, a little enquiry has shown that they belong to or are part of a numerically strong caste

or tribe in Madras The distinctively Mysore castes are exceedingly few in fact with the possible exception of the Gangadikara Vakkaligas there is hardly any caste that can be termed so The Holeyas Bedas Agasas Sivandas Madigas, Kumbaras and Gangas who all have nothing to show they are not indigenous to the State have much in common with their namesakes in Bellary Anantapur and other districts of Madras though owing to obvious reasons they have for ages kept to themselves

It is therefore not unreasonable to suppose that the whole country south of the Krishna is ethnologically one block. Though intrusion from one side or another has been possible—especially in the case of Mysore as already stated—still such intrusion it has been possible to trace both from the physical and linguistic points of view and to locate and even separate to some extent This being so it follows that the conclusions of a physical survey—such as it has been—of this area should be taken to be of general though not of universal application to every part of it. As we have seen such a complete survey is still a desideratum that however need not deter us from noting the few broad generalizations to which the evidence so far gathered has led competent investigators.

Southern India an ethnological block

It is now fairly established that some at least of the forest and hill tribes of Southern India including in that term the Mysore State represent racially a population that is distinct from the Dravidians who form the main bulk At one time when our knowledge of the racial origins of the people of the south was not even as great or as good as now it was held by many notably by Dr Caldwell for instance, that the jungle and hill tribes and the servile castes of the south were a section of the Dravidians who had been driven to the hills or rendered servile by the rest of their own people This theory

The Dravidian problem

finds very little support, if any at all, now Opinion favours the view that some at least of these tribes and castes belong to a race of people who, for want of a better name, have been called the Pre-Dravidian race These include the Kurumbars, the Soligars, the Irulans, the Chenchus, the Yenadis, the Kadirs, the Kanikars, the Malai Vedars, the Paraiyans, the Pallyans, the Vedans, the Bedars and many others that may be mentioned. The Bedars have in the Canarese Districts attained to a high position in the social scale, but this is largely due to their having been in the wars of the 18th century engaged as soldiers in Hyder's armies, and later in the irregular hordes kept up by a number of *Palaigars* in Madras, Mysore, and the Southern Mahratta country The Vedans of the Tamil country belong essentially to the same stock and in some instances the Vedans, who live by the chase, as their name would indicate, are still to be met with in the recesses of the thickest forests in Southern India To the same stock, probably, must be traced the Veddas, really a corrupted form of the Tamil Veda and the Kannada Bedar, both meaning 'Hunter,' of the Island of Ceylon These are so very like in appearance to the many jungle tribes of Southern India that, when Mr Edgar Thurston of the Government of Madras saw a number of photographs of Veddahs, brought by Dr and Mrs Seligmann, he made the remark that he should not have known them from photographs of members of a number of Indian jungle tribes Dr and Mrs Seligmann themselves state their view of the Veddahs in fairly definite terms They write —"We regard them as part of the same race as the so-called Dravidian jungle tribes of Southern India" Dr Haddon also considers that this jungle tribe of Ceylon should be classed with the Kurumbars, Irulas and some other jungle tribes of the Deccan as Pre-Dravidian This point may be taken as fairly settled, but the question still

remains to what branch of the hominidæ should we ascribe these kindred jungle tribes of South India and Ceylon This is a point that has given rise to much discussion but it is not yet satisfactorily settled Much confusion has arisen in the discussion of this subject by the lax manner in which the term Dravidian has been used, a kind of usage that still lurks it must be added in the writings of even recent writers. It is convenient to reserve the term 'Dravidian to those people who racially are distinct from the Aryans on the one side and the Pre Dravidians, we are just discussing on the other

De Quatrefages theory

One set of writers have maintained that the Pre Dravidians are the representatives of a submerged Negrito element that in early days found its way into Southern India. De Quatrefage was amongst the first to suggest this theory He believed in the widespread dissemination of the Negrito race and as time went on his theory gained weight with many writers. Topinard speaks of the remnants of a black race as being shut up in the mountains of Central India and in the south under the name of Yenadis Maravers Kurumbars Veddas etc Sir George Campbell says I take as a great division of tribes and castes the black aboriginal tribes of the interior hills and jungles. There can, I suppose be no doubt that they are the remnants of a race which occupied India before the Hindus They are evidently the remains of an element the greater portion of which has been absorbed by or amalgamated with the Modern Indian race. And regarding the Pre Dravidian race as a race of Negritos he says that among some of the inferior tribes of the south the remains of the thick lips the very black skin and other features may still be traced but colour, perhaps excepted the aboriginal features are probably gradually wearing away This theory which had met with certain silent opposition in

certain quarters, was re-stated with vigour not long ago by Dr Keane His argument is best stated in his own words After premising that "all the pre-historic movements must in fact be assumed to have set from the north southwards, so that the whole of the Peninsula was occupied during the Stone Ages, successive streams of primitive peoples descending from the Himalayan and Vindhyan slopes to the extremity of the mainland," he says —"The first arrivals were undoubtedly the *Negritos*, whom I have called the 'submerged element,' because they now form the substratum, have nowhere preserved their racial or social independence, have even lost their original Negrito speech, and are now everywhere *merged* in the surrounding Kolarian and Dravidian populations Whence came this black element, the presence of which I hope here to place beyond reasonable doubt? Herr Fehlinger thinks they reached India partly from Africa and partly from Australia But I cannot believe that there are two black strains in India One satisfies all the conditions and that one can scarcely have come either from Africa which is barred by the Indian Ocean or from Australia which is shut off by the Eastern Archipelago Moreover, both Africans and Australians are mostly tall (five feet eight to ten inches), whereas the Dravidians and Kolarians, amongst whom black is conspicuous, are nearly all undersized—the Koravas (five feet three inches) and many Korava women real dwarfs (about four feet nine inches), the Jurungs still shorter, and are five feet, women, four feet eight inches The inference is that in India the dark autochthons were pigmies apparently [illegible] to the Negritos of the Philippines and to the Semangs and Sakais still surviving in the Malay Peninsula. From Malacca the woolly-headed Negritos could easily have [illegible] the two Tenasserim and Arakan round the Bay of Bengal to the Himalayan slopes, where they [illegible] and whence they

gradually spread over the Peninsula most probably in early Palæolithic times Their spoor may everywhere be followed from Negroid flat-faced curly haired, Kocch of Assam 'with the thick protuberant lips of the Negro to the swarthy and irregular featured Nepalese *Hayas* and thence to the numerous *Santals* of Chota Nagpur with a cast of countenance almost approaching the Negro type and to the neighbouring *Dhanjyas* (Bhumiyas) with 'coarse negro-like features and frizzly hair and the diminutive Juang jungle folk with depressed nasal bone dilated nostrils large mouth very thick lips and black frizzled hair The kindred *Dhanjars Khonds* and *Gonds* of the Vindhyan Range show to this day features more closely resembling the *lower negro type* than any I have met with amongst the tribes of Bengal Thus speaks Dalton who knew these Vindhyan hill men well, and who adds that here we still find specimens of the lowest type of humanity creatures who might justly be regarded as the unimproved descendants of the manufacturers of the stone implements found in the Damodar Coal Fields. These are the true aborigines, the *Asuras* from whom a considerable proportion of the black pigment is derived that has darkened the skins of a large section of the (Indian) population Equally unmistakable evidences of the underlying Negroid element are presented by the low caste hill men of the southern uplands. Some years ago, Drs F Jagor and G Koerbin collected a great body of anthropological data from over two hundred and fifty of these aborigines representing as many as fifty four tribes from almost every part of the Madras Presidency Since then the list has been supplemented by the researches of Mr E Thurston of Mr H V Nanjundayya of Mysore and of Mr Anantha krishna Iyer of Cochin We are now, therefore in a position to speak with confidence of the general physical characteristics of these jungle peoples It will

suffice to say that Negroid contacts and influences are almost everywhere betrayed in the black colour, crisp or frizzly hair, broad nose, thick lips, low stature, very long arms, and other marked Negro traits of these aborigines Thus, the Veddas of Travancore are described as all but black, with hair very black, wavy and crisp and similar characters are attributed to the Paniyans of the Wynaad, the Kadars and Malasars of Coimbatore and Cochin, the Kurumbars and Irulas of the Nilgiris, the Malayalis, the Pallis, Shanars and Katumaratis of the Salem District, the Vellalas of Madura and above all to the Paniyans of pronounced Negro features Dr Keane also adduces the evidence derived from numerous recent photographs, "which also reveal" according to him "Negroid traits" in a very striking manner Such are the Kadar men, several of the Malayan and Iruvallan women, the Izhuva and Thandapulaya groups (in Cochin). He then adds —

"Now comes the question, how have the present Dravidian and Kolarian low castes acquired these Negroid characters which could not have been brought from beyond the Hindu-Kush or the Himalayas, where the indigenous populations have always been either white, regular-featured Aryans of Caucasic type or else yellow, lank-haired Mongols? The inference seems obvious that these Dravidians and Kolarians are a blend in diverse proportions of Asiatic intruders with the true black indigenes of the Peninsula In other words, they acquired their Negroid characters by secular interminglings with Negrito aborigines"

If this is so, how did the original aborigines lose their own language? Dr Keane thinks that they dropped it as they got absorbed by the Kolarians and Dravidians Here is his theory in full —

"Beyond the Vindhyan Range, they (the Kolarians who, according to him, came from the north-east and the Dravidians, who came from the north-west) have everywhere absorbed or replaced both the Negrito substratum and the

Kolarian indigenes. Hence it is that at present all the natives of the southern uplands—Mysore Coorg Cochin Travancore etc. speak various forms of the Dravidian mother tongue Here again Mr Ananthakrishna Iyer unconsciously supplies some particulars of great ethnical value. Thus we learn that the Nattu Malayalam speak a mixed Tamil Malayalam dialect with such a peculiar pronunciation as to be quite unintelligible to the more cultured Dravidians of the plains In fact their command of articulate speech is so weak that the defect is made up by *gestures*. The Nayadis also speak Malayalam and pronounce it so badly that strangers cannot easily comprehend their speech and the same is true of the Pulayans, if not of all the jungle peoples without exception All this finds its counterpart amongst the descendants of the plantation negroes, whose mother tongues have, for many generations, been English, French Spanish or Portuguese yet they still continue to mispronounce or speak these languages barbarously The phenomenon is explained by the Russian explorer Miklukho Maclay who rightly attributes the absolute impossibility of our imitating certain utterances in some of the New Guinea languages to fundamental differences in the anatomical structure of the larynx and the whole muscular system of the organs of speech in the two races (European and Papuan) But anatomical differences imply racial differences, and thus we again see that the Cochin and other low caste aborignes now speaking broken Dravidian dialects were not originally Dravidians but as above pointed out a blend in diverse proportions of super imposed Negrito Kolarian and Dravidian racial strata.

Such is the theory of Dr Keane in nearly his own words While he is definite in his views and goes as far as one could in the line of argumentation he puts forward there are writers who are inclined to be a great deal more cautious in their inferences They are content to leave matters in a more fluid state. They are impressed with the difficulty of evolving anything like a reasonable theory out of the conflicting data available. While Dr Keane finds unmistakable traces of a submerged Negrito element in the South Indian population

Review of other theories.

M Louis Lapicque finds no evidence of a race as regards purity of race to be compared, for instance, to the Negritoes of the Andamanese Mr M Lapicque has been rather widely followed by a number of recent writers Mr E Thurston, whose knowledge of South Indian jungle tribes is unique, and Dr A C Haddon incline to favour the term "Pre-Dravidian" Mr E Thurston styles them the modern representatives of the Dasyus (referred to in the Hindu sacred writings and tradition) or black skinned, noseless, unholy savages According to recent nomenclature, these Pre-Dravidians are said to belong to the group of *Melanous Dolichocephalic Cymotrichi*, or dark skinned, narrow headed people with wavy or curly (not woolly) hair, who are further differentiated from many of the Dravidian classes—Tamil, Telugu, Kannada, etc —by shortness of stature and broad (Platyrhine) noses That the primitive inhabitant of South India was dolichocephalic or subdolichocephalic is amply proved by the researches of Mr Thurston among the jungle tribes of the Tamil, Telugu and Malayalam tracts The table of cephalic indices published by him strikingly illustrates this point

Racial affinities of Pre Dravidians

Both Mr Thurston and Dr Haddon agree in thinking that the Pre-Dravidians are ethnically related to the Veddas of Ceylon and the Sakais of the Malaya Peninsula Mr Thurston thus sums up his theory briefly in one of his recent contributions —

"These are," he says, "strong grounds for the belief that the Pre-Dravidians are ethnically related to the Veddas of Ceylon, the Toalas of the Celebes, the Batin of Sumatra, the Sakais of the Malaya Peninsula, and possibly the Australians Much literature has been devoted to the theory of the connection between the "Dravidians" and the Australians, partly on the strength of certain characters which the Dravidian and Australian languages have in common and the use by certain

Dravidian castes (Kallan and Maravan) of a curved or wooden throwing stick called Kaha Tadi which is supposed to bear a resemblance to the Australian boomerang. Huxley even went so far as to say that an ordinary coolie such as one can see among the sailors of any East Indiaman in the London Docks would if stripped pass very well for an Australian although the skull and the lower jaw are generally less coarse. According to Wallace the Indo Malaya Archipelago comprising the Islands of Borneo Java and Sumatra was formerly connected by Malacca with the Asiatic continent while the Austro-Malayan Archipelago comprising Celebes the Moluccas etc., was directly connected with Australia. An important ethnographic fact is that the method of tree climbing by means of bamboo pegs resorted to by the Dayaks of Borneo as given by Wallace might have been written on Anamalai Hills of Southern India and would apply equally well in every detail to the Pre Dravidian hillmen who inhabit that mountain range. Still further affinities between these people and the inhabitants of the Malaya Archipelago are illustrated by the practice of chipping the incisor teeth and the wearing by adult females of a bamboo hair comb the design on which bears a striking resemblance to that on the combs worn by some Malaya tribes. This theory received support from or is rather partially based upon the investigations of writers who have worked amongst the Sakais on the one hand and the Australians on the other. Writing of the racial affinities of the Sakais, Skeat and Blagden write: An alternative theory comes to us on the high authority of Virchow who puts it forward however in a somewhat tentative manner. It consists in regarding the Sakai as an outlying branch of a racial group formed by the Veddas (of Ceylon) Tamil Kurumba and Australian races. Of these the height is variable but in all four of the races compared it is certainly greater than that of the Negrito races. The skin colour again it is true, agrees to a remarkable degree but the general hair character appears to be uniformly long, black and wavy and the skull index on the other hand appears to indicate consistently a dolichocephalic or a long shaped head. Referring to the Sakais, they remark — In evidence of their striking resemblance to the Veddas it is perhaps worth remarking that one of the brothers Sarasin who had lived

among the Veddas and knew them very well, when shown a photograph of a typical Sakai, at first supposed it to be a photograph of a Vedda "

Commenting on this passage, Mr Thurston writes —

" For myself, when I first saw the photographs of Sakais published by Skeat and Blagden, it was difficult to realize that I was not looking at pictures of Kadirs, Paniyans, Kurumbars or other jungle folk of Southern India "

Then again, writing of the racial affinities of the Australians, Prof R Semon says —

" We must, without hesitation, presume that the ancestors of the Australians stood, at the time of their immigration to the continent, on a lower rung of culture than their living representatives of to-day Whence and in what manner the immigration took place it is difficult to determine In the neighbouring quarter of the globe, there lives no race which is closely related to the Australians Their nearest neighbours, the Papuans of New Guinea, the Malays of Sunda Islands, and the Maoris of New Zealand, stand in no close relationship to them On the other hand, we find further away, among the Dravidian aborigines of India, types which remind us forcibly of the Australians in their anthropological characters In drawing attention to the resemblance of the hill-tribes of the Deccan to the Australians, Huxley says 'An ordinary cooly such as one can see among the sailors of any newly arrived East India vessel, would, if stripped, pass very well for an Australian, although the skull and the lower jaw are generally less coarse' Huxley here goes a little too far in his accentuation of the similarity of type We are, however, undoubtedly confronted with a number of characters the full formation, features, wavy curled hair—in common Ceylonen the Australians and Dravidians, which gain in im-Sakaisince from the fact that by the researches of Norris, Bleak Much Caldwell, a number of points of resemblance between the connec-alian and Dravidian languages have been discovered, and partly lespite the facts that the homes of the two races are so and Apart and that a number of races are wedged in between

them, whose languages have no relationship whatever to either the Dravidian or Australian There is much that speaks in favour of the view that the Australians and the Dravidians sprang from a common main branch of the human race According to the laborious researches of Paul and Fritz Sarasin the Veddas of Ceylon whom one might call Pre Dravidians would represent an off shoot from this main stem When they branched off they stood on a very low rung of development and seemed to have made hardly any progress worth mentioning."

In this passage the terms Dravidian aborigines "Dravidians and Pre-Dravidians are used in a rather loose manner and one is not quite clear as to who it is that Prof. Semon is really writing of It would appear that following the earlier writers who used the term Dravidian to represent the Pre-Dravidians as well as the Dravidians, he uses the one as synony mous with the other in one place while he reserves the title of Pre Dravidian to the Veddas. At the same time, it seems apparent he is thinking of Dravidians proper when he speaks of the language of Dravidians and calls in the help of linguistic analogy to decide in his favour The same confusion is to be traced in the writings of more recent writers. This shows how necessary it is to use the term Dravidian in its more restricted sense of designating the more advanced castes and tribes of Southern India speaking the languages that have been grouped under the head of Dravidian If the language of the Dravidians proper was also the language of Pre Dravidians Prof Semon and those who have followed him may have some justification for their use of terms in the manner they have done But it is almost a case of begging the question when we assume that their languages were identical It is true that all speak the same languages now having regard to the linguistic areas in which they live but have they done

so in primeval times? If not, can it make for scientific accuracy if this terminological inexactitude is perpetuated indefinitely? It may be conceded that certain at least of the jungle tribes of Southern India have much in common with the Veddas of Ceylon, the Sakais and the other tribes of Malay Peninsula and with the Australian aborigines But it is a question if the Dravidian proper did not find his way into Australia as well in later times If he did, the existence of the boomerang in Australia and the resemblances that have been traced between the Dravidian and Australian languages are easily explained This aspect of the question will be further referred to later on in this chapter It may suffice here for the present to note that such a migration in primeval times is rendered probable when we remember that otherwise it is difficult to explain the observed similarities in language and social system in the Dravidians proper and the Australians

That Australia was open on the north and north-west to primitive migration both from India and Papuasia seems admitted by those who have considered this question in any detail "That such migrations took place," writes Dr A H Keane, "scarcely admits of any doubt," and the Rev John Matthew concludes that the (Australian) continent was first occupied by a homogeneous branch of the Papuan race either from New Guinea or Malaysia and that these first arrivals, to be regarded as true aborigines, passed into Tasmania, which at that time probably formed continuous land with Australia Thus the now extinct Tasmanians would represent the primitive type, which, in Australia became modified, but not effaced, by crossing with later immigrants, chiefly from India These are identified, as they have been by other Ethnologists, with the Dravidians, and the writer remarks that 'although the Australians are still in a state of savagery and the Dravidians of India

have been for many ages a people civilized in a great measure and possessed of literature, the two peoples are affiliated by deeply marked characteristics in their social system as shown by the boomerang which unless locally evolved must have been introduced from India But the variations in the physical characters of the natives appear to be too great to be accounted for by a single graft hence, Malays also are introduced from the Eastern Archipelago which would explain both the straight hair in many districts and a number of pure Malay words in several of the native languages. The evidence of Geology appears to support this view 'It is highly probable writes Mr W T Blanford in his *Manual of Geology of India* that the metamorphic area of Eastern Burma was land in tertiary period and that the older tertiary deposits of Assam Burma and the Malaya Islands were formed in a deep gulf around and amongst an archipelago like that now existing further to the south-east Some peculiarities of the recent Fauna indicate a connection between the Malaya Islands, Southern India and Africa in early tertiary times and a land area may have extended to the south of India at this period That migration from India was possible in primeval times may be inferred to some extent by the fact that migration has long been going on from the eastern Sea board of India to Burma and the French Indies on the one side and the Straits Settlements on the other In the former inscriptions and architectural remains attest to Indian migration within historical times, while in the latter—in Java and Sumatra in particular—Hindu influence was at one time so predominant both in religion and arts that volumes have been devoted to them by Dutch writers Apparently Kalinga kings and people occupied the islands in the fifth and the sixth centuries of the Christian era, if not earlier Inscriptions found in West Java specifically name Kalinga In India as the region from which the Hindu colonists

emigiated "Kalinga" was in populai Javanese corrupted into "Kling" a name by which all people of India, irrespective of iace oi cieed, are still known to the Javanese and others Kalinga was in ancient times the name given to a kingdom on the east coast of India which had its capital at Vengi or Vegi, in the modern Kistna District Even now, migration to Straits Settlements fiom the Distiicts of South Arcot and Tanjoie is a well-recognized fact, and often exceeds 50,000 peisons in a year

The Dravidians proper The theory of early Philologists

Now we come to the Dravidians proper As already pointed out, much confusion in thought and writing has crept in by the loose use of the term "Diavidian" If we iestrict the term "Pre-Dravidian" to the iace that is now represented by jungle tiibes and servile castes of Southern India, we shall have gained a distinct step forwaid in Indian Ethnological terminology We can, in that case, reserve the teim "Dravidian" to the castes and tribes which, bioadly speaking, are fairly advanced in the social scale and aie speaking either one or other of the Diavidian languages or dialects The term "Diavidian" it would be best to reserve to the generality of the South Indian people who are neither "Pie-Dravidian" nor "Aryan," using the latter term in its usually accepted sense Who were these Dravidians and how did they ieach Southern India? There aie diveigent theoiies on these inteiesting questions and all that can be attempted heie is but a biief ieference to them The earliei speculators in Indian ethnological discussions weie mostly philologists, who based their classification of iaces on language By obseiving a ceitain numbei of common characteristic featuies of a number of languages, they concluded that the iaces who spoke those languages should belong to the same race. Though this principle of classification of races has been very geneially

discredited it has unfortunately left some relics of its former strength in many different places. Amongst these India must be counted as one. These philologists observed many characteristics common to Turanian languages amongst which they brought in the Dravidian group and from them they inferred as was usual in their days the racial identity of the various peoples speaking them Thus were the Dravidians traced to the Turanian family The theory was developed in its completest form by Max Muller and Bunsen and widely followed until very recently by most writers on Indian History According to Max Muller and Bunsen there were Turanian migrations towards the north and towards the south One migration to the north settled on the Rivers Meikong Menam the Irrawady and the Brahmaputra and formed the Tai tribes while one to the south followed the courses of the Amur and the Lena and founded the Tongusic tribes A second migration to the south finding the country occupied pushed on to the islands and the sea and laid the foundation of the Malay tribes, while a second to the north is supposed to have originated the numerous Mongol tribes and to have pressed westward along the chain of Altai Mountains. Still a third to the north produced the Turkish peoples even as far west as the Ural Mountains and the Frontier of Europe A third to the south is believed to have advanced towards Tibet and India and in later times to have poured its hordes through the Himalayas and to have formed the original native population of India The last Turanian wanderers to the south were, according to this theory the forefathers of the Tamils and allied peoples and the last to the north were the ancestors of the Finns and of the Basques in Spain as well as of the Samoieds in Siberia All these moving streams of people it should be remembered flowed from the mountain plateaus of Central Asia long before the Historic period

This theory is, however, open to criticism The only evidence of these Turanian migrations lies in the structure of a number of languages Neither tradition, nor song, monument, nor historical record has preserved any mention of these primeval wanderings of the first races of Turanian men and women The theory rests solely on the morphological classification of languages. The upholders of the theory believe that this classification may be used as a test of race inasmuch as, according to them, all those who speak isolating languages belong to one racial stock, those who speak inflexional languages to another, those others who speak agglutinative languages to still another, and so on The argument, however, fails when applied to the agglutinative languages, the very ones upon which the theory in question rests, for the speakers of these belong to different racial stocks

If Mr Keane's view be correct, the whole theory is untenable He says that isolating, inflexional, and polysynthetic families of languages are all derived from separate agglutinative types "The true test of agglutination," he says, "is the power of particles to become detached and shift their places in the combined form

A vast number of languages are of this agglutinating order, from which all the others have emerged in diverse directions . From that stage language developed according to its different initial tendencies in various directions towards complete decomposition ..

as in the isolating state of the Indo-Chinese group; partial decomposition as in the particular languages of the Malayo-Polynesian group, Polysynthesis, as in most of the American groups, and synthesis as in the inflecting Aryan, Semitic, and Hametic groups And if it is objected that some languages have never got beyond the agglutinating stage, the answer is that some animals have never got beyond the classes of fishes or reptiles"

This theory of evolution of speech has been objected to by the upholders of the old, but now exploded theory of root origin Thus Sayce speaks of the magical frontier between flexion and agglutination which can never be cleared since to pass from agglutination to inflexion is to revolutionize the whole system of thought and language and the basis on which it rests and break with the past psychological history and tendencies of speech But as Jespersen says revolutions do take place in the world of languages, even if they take more time than it takes the French to change their constitutions. If a thousand years suffice to change a type of speech like that of king Alfred into the totally different one of Queen Victoria then the much longer period which Palæontologists and Zoologists accord to mankind on this earth could work still greater wonders Sayce stands with regard to these three or four types of speech in much the same attitude which Naturalists kept with regard to the notion of 'Species before Darwin came

Dr Caldwell one of the supporters of N W passage theory is strongly against the Southern Dravidians being classed in regard to their physical characteristics with the Turanians or Mongolians Fergusson curiously enough attributes a southern origin to them but yet calls them Turanians Dr Caldwell thinks that there is no difference between the heads or features of the Dravidians and those of the Brahmans, and says that the varieties of feature or physiognomy and colour are so minute and unimportant that in the absence of any class difference in the shape of the head they are consistent with the supposition of oneness of blood and may be safely referred to local social and individual causes of difference—the caste system, the prohibition of intermarriages and social intercourse, and the absence of common bonds of sympathy The Dravidian type of

head, he says, will even bear to be directly compared with the European Even among the lowest classes of Dravidians, the Mongolian smoothness of skin, scantiness of hair, flatness of face, and the peculiar monotonous olive hue of the Mongolian complexion are never met with As regards other elements of the Mongolian type, it is chiefly, if not solely, among the lower classes that they are seen, and they do not constitute the class type of any caste whatever They are, Dr Caldwell says, exceptional instances, which scarcely at all affect the general rule. He adds, "I have no doubt that similar exceptional instances could easily be pointed out amongst the lower classes of our own race" On the whole, he is inclined to believe in the Caucasian physical type of the Dravidians. To prove the general correctness of his reasoning, he points to the physical type of Todas, who are so distinctly Caucasic in the opinion of many persons that they have been regarded as Celts, Romans, Jews, etc Of all Dravidian tribes, they have been most thoroughly guarded by their secluded position from Brahmanical influences Instead of being more Mongol-like than the Aryanized Dravidians, they are distinctly Caucasic Sir George Campbell is of the same opinion. Dr Caldwell and Sir George Campbell, though they believe in the Caucasic type of the Dravidians, do not assign satisfactory reasons for their belief The N -W Passage theory is their stumbling block The fact seems to be that the Caucasic human type, having evolved itself in the Northern regions of Africa, successively spread itself over Northern Africa, Southern India and Australia through the then existing Indo-African-Austral continent, northwards to Iberia and thence to West and Central Europe The first migrating groups seem to have been of a low type, and to one of these must be traced, through the then existing Indo-African continent, the peoples of Southern India by a melanchoroid Caucasian type during the late phocene

ond early pleistocene times, from the East or the South, in all probability from the South That such was the case is proved not only by the fact that the Dravidian now presents a melanchoroid Caucasia physical type but also by the fact that the Australians retain certain Caucasian physical characteristics which could only be explained by a migration of Indian Melanchoroid Caucasians into Australia when the Indo-African Austral continent existed and Australia was accessible on the north and north west sides to migrations from both India and Papuasia. Leading Ethnologists are strongly of opinion that there is a marked resemblance between the physical type of the Dravidians and that of the Australians

Flower and Lydekker bring under Caucasian Melanchoroid the Dravidians and Veddas of Ceylon and in regard to Australia say that it might have been originally peopled with frizzly haired Melanesians but a strong infusion of some other race probably a low form of Caucasian Melanchoroid such as that which still inhabits the interior of the southern parts of India has spread throughout the land from the north west and produced a modification of the physical characters especially of the hair Mr Crooke says that the Dravidians represent an emigration from the African continent and Professor Semon says that 'the features of the Australians with all their ugliness and coarseness frequently remind one of the Caucasian features. De Quatrefages recognizes the existence of Caucasian, Negro and Mongol elements in Australia and lastly Giglioli goes so far as to speak of an Aryan element in Australia.

Again Zoology Geology and Botany are all at one in declaring that South India in early times was peopled from the south and not by the N W Passes of India Peschel suggested that the primeval home of man was a

continent now sunk below the surface of the Indian Ocean which extended along the south of Asia as it is at present, towards the east as far as Further India and the islands, and towards the west as far as Madagascar and the south-east shores of Africa To this hypothetical continent he gave the name of Lemuria, from the mammals of that name which were characteristic of it Though the Lemurian hypothesis as at first propounded and for the purposes it was originally intended to serve, has been rightly rejected by Wallace, yet his categorical denial of an Indo-African-Austral continent in pre-tertiary times cannot be accepted. It has been pointed out that he has not fully stated the facts, and that the actual distribution of certain genera, of birds, fishes, reptiles and land mollusca, is strongly suggestive of dry land having formerly extended from Southern India to Madagascar This view has been confirmed by the investigations of the Indian Geological Survey

Mr Oldham says that, at the close of the jurassic period, the land connection with Africa was still maintained, as also in the cretacious period, the close of which witnessed the great outburst of volcanic activity which buried the whole of Western India deep in lava and ashes, contemporaneous with the great series of earth movements which resulted in the elevation of the Himalayas and the extra Peninsular ranges generally In the tertiary era, we find no further evidence of land connection with Africa, at an early period, the West Coast was approximately in its present position and it is probable that at the close of the cretacious and commencement of the eocene period, the great Indo-African continent was finally broken up and all but the remnants in India and South Africa sunk finally beneath the sea

A third objection to the Turanian and N -W Passage hypothesis is that they make the physical type of the Dravidians Mongolian Mr Hodgson, who is followed

by later writers says, that in the Tamilian form there is less height, less symmetry, more dumpiness and flesh than in the Aryan in fact a somewhat lozenge contour caused by the large cheek bones less perpendicularity in the features to the front occasioned not so much by defect of forehead and chin as by excess of jaws and mouth, a larger proportion of face to head and less roundness in the latter a broader flatter face with features less symmetrical but perhaps more expressive at least of individuality a shorter wider nose often clubbed at the end and furnished with round nostrils eyes less and less fully opened and less evenly crossing the face by their line of aperture ears larger lips thicker beard deficient colour brunette as in the Aryan type, but darker on the whole and as in it very various. It may be at once bluntly said that this description does not in the least apply to the Dravidians whether civilized or uncivilized, of Southern India. As Dr Caldwell says — Many of these physical characteristics which Mr Hodgson attributes to the Tamilians may undoubtedly be observed in the Sub-Himalayan tribes of Nepal and Assam, and in a smaller degree in the Santals and Kols but in these two it has been pointed out by eminent Indian and Foreign Ethnologists that the Dravidian type prevails The inexpediency of using as a general appellation so definite a term as Tamilian appears from the error into which Mr Hodgson has fallen of attributing the same or similar physical characteristics to the Dravidians or Tamilians of Southern India, as to his northern Tamilian tribes though they differ from these almost as much as do the Brahmins themselves. On the whole it seems that Mr Hodgson and others of the school persuaded by similarities of lingual characteristics in the so-called Turanian group of languages, were led to believe in a similarity of physical type among the different members of that group

The Theory of the Craniologists

Though this view has something to be said for it, it has not been by any means uniformly accepted It has been rejected wholesale by Sir Herbert Risley. Sir William Turner, the great Craniologist, has also not accepted that part of the theory which finds similarities between the Dravidians and the Australians He finds the differences between the skulls of the two peoples too radical to admit of their origins being identical He says that "by a careful comparison of Australian and Dravidian Crania, there ought not to be much difficulty in distinguishing one from the other The comparative study of the characters of the two series of crania has not led me to the conclusion that they can be adduced in support of the theory of the unity of the two people" It is a question if the term "Dravidian" is here used in the strict sense of defining a person who is neither a "Pre-Dravidian" nor an "Aryan" There is some evidence in the writings of Sir William himself to show that he is actually thinking of "Pre-Dravidians" while he is writing of "Dravidians" Sir Herbert Risley follows him so far as to say that his is "the last word of scientific authority" But Sir Herbert's own theory is somewhat complicated He denies that the Dravidians ever came through the North-West Passes of India and suggests that "they are the earliest inhabitants of India of whom we have any knowledge" He also agrees with Sir William Turner in the view that no direct evidence of either a past or a present Negrito population in India has yet been obtained This naturally leads him to a novel classification, based primarily on anthropometric grounds, of the Dravidians, a term which, according to him, would include both Pre-Dravidians and Dravidians While to Mr Thurston, for instance, the Paniyans of Malabar and the South-East Wynaad are typical of the Pre-Dravidian tribes of Southern India, to Sir Herbert Risley, the self-same Paniyans are one of the two "most

characteristic representatives of the Dravidian type in all India between the Valley of the Ganges and the Island of Ceylon the other being the Santals. The Santals according to Dr Keane are not Dravidians at all but a tribe belonging to the Kolarians Where such fundamental differences and views exist It is best to be a little more explicit. In denying a trans Himalayan origin to the Dravidians Sir Herbert says he combats the view of Sir William Wilson Hunter that the Dravidians and Kolarians belonged to one racial stock and that they entered by the N W and N E Passes of India and came into conflict later on the Vindhyas from whence the Dravidians marched down to the south This theory as already stated above is based partially on the writings of Max Muller and Bunsen Sir Herbert in rejecting it says — The basis of this theory is obscure. Its account of the Dravidians seems to rest upon a supposed affinity between the Brahui dialect of Beluchistan and the languages of Southern India while the hypothesis of the north-eastern origin of the Kolarians depends on the fancied recognition of Mongolian characteristics among the people of Chotia Nagpur But in the first place the distinction between Kolarians and Dravidians is purely linguistic and does not correspond to any differences of physical type. Secondly it is extremely improbable that a large body of very black and conspicuously long headed types should have come from the one region of the earth which is peopled exclusively by races with broad heads and yellow complexions. With this we may dismiss the theory which assigns a trans Himalayan origin to the Dravidians. Taking them as we find them it may safely be said that their present geographical distribution the marked uniformity of physical characters among the more primitive members of the group their animistic religion their distinctive languages their stone monuments and their retention of a primitive system of

totemism justify us in regarding them as the earliest inhabitants of whom we have any knowledge" That, it may be said in one word, evades the whole point at issue The question is, where did the Dravidians come from? Sir Herbert Risley leaves the question where it was before he tackled it He does not appear to suggest that they are autocthonous, rather he would seem anxious to leave the question open for the time being Then as to his classification of the Dravidians, he divides the Dravidians of India into four main groups, the Scytho-Dravidian, the Aryo-Dravidian, the Mongolo-Dravidian, and the Dravidian, each of which he thus describes —

(1) The Scytho-Dravidian type of Western India, comprising the Mahratta Brahmins, the Kunbis, and the Coorgs, probably formed by a mixture of Scythian and Dravidian elements, the former predominating in the higher groups, the latter in the lower The head is broad, complexion fair, hair on face rather scanty, stature medium, nose moderately fine and not conspicuously long

(2) The Aryo-Dravidian type found in the United Provinces of Agra and Oudh, in parts of Rajputana, in Bihar and Ceylon, and represented in its upper strata by the Hindustani Brahmin and in its lower by the Chamar Probably the result of the intermixture, in varying proportions, of the Indo-Aryan and Dravidian types, the former element predominating in the lower groups and the latter in the higher The head form is long with a tendency to medium, the complexion varies from lightish brown to black, the nose ranges from medium to broad, being always broader than among the Indo-Aryans, the stature is lower than in the latter group and is usually below the average by the scale given above

(3) The Mongolo-Dravidian type of Lower Bengal and Orissa, comprising the Bengal Brahmins and Kayasthas, the Muhammadans of Eastern Bengal, and other groups peculiar to this part of India Probably a blend of Dravidian and Mongoloid elements with a strain of Indo-Aryan blood in the higher groups The head is broad, complexion dark, hair on

face usually plentiful stature medium nose medium with a tendency to broad

(1) The Dravidian type extending from Ceylon to the valley of the Ganges and pervading the whole of Madras, Hyderabad the Central Provinces most of Central India and Chutia Nagpur Its most characteristic representatives are the Paniyans of the South India Hills and the Santals of Chutia Nagpur Probably the original type of the population of India, now modified to a varying extent by the admixture of Aryan Scythian, and Mongolian elements. In typical specimens, the stature is short or below mean the complexion very dark approaching black hair plentiful with an occasional tendency to curl eyes dark head long nose very broad sometimes depressed at the root but not so as to make the face appear flat.

This classification of Sir Herbert has been vigorously assailed from two sides. Dr Haddon thinks that it is vitiated by the introduction of the Scythian element into the discussion, an element of whose racial origins scarcely anything definite is known Then Dr Keane has attacked Sir Herbert's theory as unsatisfactory because it does not, according to him take into consideration all the known facts He protests against the confused lumping together as he calls it, of many primitive peoples as Dravidians or Mongolo-Dravidians or Aryo-Dravidians or Indo-Aryans or Scytho-Dravidians or 'by other equally unintelligible and misguiding complex terms. Surely he adds groups needing to be thus expressed by compound terms must be assumed to represent still earlier crossing which however no attempt is here made to determine. He then proceeds — 'Thus in their Census Reports Sir Herbert Risley and his fellow worker, Mr E A Gait denounce the time honoured term Kolarian (revived by Sir George Campbell) as altogether fantastic, and relegate the Kolarians themselves with 'The lost Ten tribes to cloudland Deceived by the remarkably uniform results of his own

anthropometric studies, Sir Herbert claims to have disproved the existence of a distinct Kolarian race, "the so-called Kolarians" being simply members of the great Dravidian family and modern researches have confirmed this view by maintaining a relationship between the Kolarian and the Dravidian Languages" (Report, Page 2789, See also Sir Herbert's *The People of India* 1908) Thus, as anthropometry claims to prove that there is no distinct *physical Kolarian* type, so philology is called in to prove that there is no distinct *linguistic Kolarian* type, so that Kolarian cannot be a stock language, but must be related to the Dravidian stock language In the Report, the prescribed Kolarian is replaced by Max Muller's *Munda*, this being one of the chief members of the group, and thus is formed the hypothetical Dravido-Munda family, which looms largely in the pages of the Report, where the two component terms are treated as two related branches of one stock language Such are the main current views, which, although they have received the seal of official authority, are radically wrong, and have in fact once more reduced Indian Ethnology to an almost hopeless state of chaos Dr. Keane goes on to remark that the Kolarians are quite a distinct people, and speak dialects belonging to a linguistic family which has no kinship whatever with the Dravidian family He also argues that the Dravidians and Kolarians are radically distinct, both in language and race, and that there is nothing in common between them His argument is too long to quote here but it lays bare the contradictory character of the reasoning adopted by Sir Herbert and his co-adjutors, the admissions they themselves make as to the essential dissimilarity of the Dravidian and Kolarian languages and ends with comparing a typical language from each family (Tamil representing the Dravidian and Santali representing the Kolarian) to demonstrate the unscientific character of the reasoning

adopted Dr Keane concludes by saying — I have gone into these details at the risk of wearying the reader in order to show once for all how absolutely unrelated are the Kolarian and Dravidian forms of speech Thus is at the same time established the radical difference of the two races who are called Dravidians in the Census Report Wherefrom did these two races reach India? Dr Keane says that as the Kolarian reached India most probably from the north or the north-east so the Dravidians came almost certainly from the north west where they appear to have left behind the belated Brahuis of Beluchistan Beyond the Vindhyan Range, they have nearly everywhere absorbed or replaced both the Negrito substratum and the Kolarian indigenes Hence it is that at present all the natives of the Southern Uplands—Mysore Coorg Cochin Travancore etc., speak various forms of the Dravidian mother tongue Sir Herbert Risley himself is hardly satisfied with his own classification Among the limitations he places on them is one that deserves to be quoted ' It may be said he says, " that the names assigned to the types beg the highly speculative question of the elements which have contributed to their formation The criticism is unanswerable One can but admit its truth and plead by way of justification that we must have some distinctive names for our types that names based solely on physical characters are no better than bundles of formulæ and that if any hypotheses of origin are worth constructing at all one should not shrink from expressing them in their most telling form The only answer to this argument is that the names are not in their most telling form and one feels that he is nowhere nearer the origins of the races after having got to the end of Sir Herbert s classification than he was before he took it up It does seem that Sir Herbert has not taken all the known facts into consideration and so has been

unable to get to the root of the matter Sir Herbert Risley's theory has been criticised from other points of view as well The interested reader will find a running summary of this criticism in Mr Crooke's introduction to his Edition of Sir Herbert's book "*The People of India*" (pp. xvii-xxi)

Dr Keane himself, it will thus be observed, is a believer in the theory which holds that the Dravidians came through the North-West Passes of India from across Central Asia He, of all recent writers, is the only one who stands for this theory, though it is difficult to say on what grounds he bases it

The complexity of the problem

Conflicting theories indicate the extremely difficult character of the Dravidian problem. If future research is to settle it in anything like a satisfactory manner, attention must be primarily directed to at least four important points —(1) Defining the term "Pre-Dravidian" in a strict manner, and scientifically tracing the affiliation of the tribes or castes that should be grouped under that head, (2) Defining likewise the term "Dravidian" and fixing likewise its exact connotation, more especially pointing out how far the term, used in a racial sense, could be held to be conterminous in its significance with the term as used in its linguistic sense, (3) Defining aright how far the descriptions of the earlier authorities of the racial affinities of the South Indian peoples should be taken as applicable to "Pre-Dravidians" and "Dravidians", and (4) Defining how far the Dravidians have absorbed or supplanted the Pre-Dravidians

Caste and race

The relation of caste to race has been much discussed, but this is hardly the place to go in any detail into the many conflicting theories which have been propounded in regard to it At one extreme is the theory of Nesfield who assumes the essential unity of the Indian race,

denies in a general difference of blood between Aryan and Aboriginal and holds that caste is merely a question of occupation According to him by the time the caste system and its restrictions on marriage had been evolved the Aryan blood had already been absorbed beyond recovery into the indigenous, so that no caste not even the Brahman could claim to have sprung from Aryan ancestors The existing differences in social rank are due solely to the character of the occupation the scavenger castes are at the bottom of the social scale then those engaged in *hunting* and *fishing* and so on through a regular gradation, to the land owners and warriors and at the top of all the priests. The antithesis of this theory is Sir Herbert Risley's view that the primary distinction was one of race engendered by the contact of the conquering fair skinned Aryans and the conquered black aborigines The former despised the latter but at first, having too few women of their own they were often obliged to take aboriginal girls as their wives Later on, when this scarcity no longer existed they closed their ranks to any further intermixture and when they did this each group became a caste like those of the present day There was a regular gradation of social rank the communities of pure Aryan and aboriginal stock being respectively at the top and bottom and those with varying degrees of racial mixture in the middle. Once started the principle of endogamy was strengthened and extended to groups formed otherwise than on a racial basis until the modern multiplicity of castes was evolved But even now caste largely corresponds to race and the social status of the caste is indicated by its physical type those at the top having an Aryan and those at the bottom an aboriginal physiognomy Taking the nose as the most characteristic feature Sir Herbert propounded that castes vary in social rank according to the average nasal index of their members. It did not of course

mean each individual caste had its distinctive physical type, but that each social stratum comprising a number of castes of similar standing can be distinguished in this way from those above and below it It seems necessary to add, as Sir Edward Gait well points out, that Risley used the expression 'Aryan' to designate the people calling themselves *Arya* or *Noble*, who entered India from beyond the North-West Frontier and brought with them the Sanscritic languages and the religious ideas to which expression is given in the Vedas and Upanishads, and whose physical type is represented by that of the Jats and Rajputs, *viz*, a long head, a straight finely cut nose, a long, symmetrically narrow face, a well-developed forehead, regular features and high facial angle He did not propose to enter on the controversy between those who, like Posche and Penka, regard the tall, blonde, dolichocephalic, and leptorrhine Scandinavian as representing the primitive Aryan type and those who, like Isaac Taylor, have held that it is to be identified with the short-headed leptorrhine neolithic race who built the dwellings of South Germany, Switzerland and Northern Italy Risley's conclusions have, however, not gained general acceptance Based on the measurements made by him in Bengal, they have been called in question by Crooke in the United Provinces, Enthoven in Bombay, and Thurston in Madras, while O'Donnell has argued that even the Bengal measurements are often at variance with it On the other hand, Nesfield's theory of racial unity is conclusively disproved by the measurements which show considerable diversity, not only in different areas but also amongst different groups of castes in the same area It is not proposed to go into this large question here except to point out that Sir Herbert Risley, has, according to competent critics, exaggerated the isolation of the present grouping of the people, and that caste, in its modern rigid form, is of comparatively recent

origin The older customs for instance recognize the possibility of a Kshatriya becoming a Brahmin or *vice versa* and although a man is supposed to take his first wife from his own class there was no binding rule to this effect while in any case he was free to take a second wife from a lower class. As Mr Crooke points out similar laxities of practice prevail at the present time among certain communities in the Himalayan Districts of the Panjab. Caste again has been habitually modified by the action of Rajahs who have not infrequently claimed the right of promoting and degrading members of the various castes The process of amalgamation of castes and tribal groups is specially observable in the case of forest tribes when they come in contact with Hinduism Each of them shows as Mr Crooke puts it a ragged fringe in which the more primitive tribe is found intermingled with the more civilized race

Origin of caste.

The origin of caste has given rise to much speculation The literature on the subject is vast. It is not possible to go here into the many theories advanced in regard to it The well known works of Nesfield Senart and Sir Herbert Risley render this task unnecessary Recent writers have adversely criticised Sir Herbert's theory which is among the latest These and other topics, interesting as they are cannot be pursued here It should suffice to state the general conclusions which may be taken as justified in the light of the many theories put forward and the criticisms offered on them

These are that caste is not unknown out of India that caste in India was not as has been said the invention of the Brahmans but the result of contact between Aryan and non Aryan races the latter contributing as much towards its formation as the former that marked physical differences between the races in India no less than the peculiar social tendencies they exhibited

contributed their quota in developing the idea of caste, that in the beginning, it was probably purely functional in character, that in later times as the area of contact grew, the growth of national, tribal, degraded and mixed castes went on practically unchecked, that possibly during this period, the functional basis changed into a hereditary one, owing as much to the influence of systematizing legists as to belief in the religious doctrine of Karma, that the development of caste in India has been both gradual and unaffected by foreign influences, that from the beginning there have been protests against its tendency to fission and debasement of human character, that the tendency of the teachings of the Upanishads and the Bhagavad Gita is to place caste on a less untenable basis, that the Jain, Buddhist, Saiva and Vedantic Schools of thought altogether ignore caste, that Manu's theory should only be treated as summing up the conditions of his time, that in so far as Manu follows the older writers in dividing castes into Brahmana, Kshatriya, Vaisya and Sudra, he is only following the usual formula enunciated by them and trying to adjust the conditions of his own time with the formula as enunciated by them, that that formula having been evolved when function probably formed the basis of caste should not be construed literally, and that regarded from any point of view, the division itself is not borrowed but indigenous

Effects of caste

As may be readily imagined, the peculiarities of the caste system have afforded occasion for the entertainment of the most divergent views as to its influence on Hindu progress We have space here only to set down a few of these opposing views to indicate the position assumed by the respective writers James Mill has denounced it as a great political blunder, fatal to free competition and opposed to individual happiness This

view however assumes a state of facts which is undeni ably non existent. As Colebrook and Elphinstone have pointed out the restri tions of caste in regard to occupa tions have had no practical effect on the people of this country Any one has been free to follow any occupa tion he chooses and even the Brahmen has been since at least the time of Manu (III 151 166) free to take to any occupation he chose Sir Henry Maine described caste as the most disastrous and blighting of human institutions. Others like Sir Rabindranath Tagore have referred to the immutable and all pervading system of caste and pointed out how it has retarded the growth of nationality in India. This view however has been subjected to acute criticism by Sir Herbert Risley in one of the best chapters of his book *The People of India* and his conclusions may be stated in a few words. Caste in particular writes Sir Herbert Risley seems at first sight to be absolutely incompatible with the idea of nationality but the History of the Marathas suggests that a caste or a group of castes might harden into a nation and that the caste organiza- tion itself might be employed with effect to bring about such a consummation A recent Missionary critic of note has stigmatized caste as a pontifical denial of the brotherhood of man Another who is alive to the advantages that caste secured to the Hindus generally in its earlier stages thinks that its religious basis is clearly dying and broadly suggests that it has outlived its usefulness. On the other hand there are not want- ing observers who hold views directly opposed to these Comte's appreciation of caste is well known He regards the hereditary transmission of functions under the rule of a sacerdotal class as a necessary and universal stage of social progress greatly modified by war and coloniza- tion The morality of caste was, he contends, an improvement on what preceded but its permanence was

impossible because, "the political rule of intelligence is hostile to human progress" The seclusion of women and the preservation of industrial inventions were, according to him, features of caste, and the higher priests were also magistrates, philosophers, artists, engineers and physicians The historian Robertson and the French Missionary the Abbè Dubois have regarded caste as the great safeguard of social tranquillity and, therefore, as the indispensable condition of the progress in certain arts and industries which the Hindus have undoubtedly made The Abbè Dubois, indeed, devotes a whole chapter of his work to prove his contention that "it is caste authority which, by means of its wise rules and prerogatives, preserves good order, suppresses vice and saves Hindus from sinking into a state of barbarism" He thinks that much of the European criticism levelled against caste is the result of the imperfect knowledge of the Hindu people and the spirit and character of their institutions "I believe," he writes deliberately, "caste division to be in many respects the *chef d'aeuvre*, the happiest effort, of Hindu legislation I am persuaded that it is simply and solely due to the distribution of the people into castes that India did not lapse into a state of barbarism, and that she preserved and perfected the arts and sciences of civilization whilst most other nations of the earth remained in a state of barbarism I do not consider it to be free from many great drawbacks, but I believe that the resulting advantages, in the case of a nation constituted like the Hindus, more than outweigh the resulting evils" Writing nearly a century later, Sir Alfred Lyall uses language almost nearly the same as the Abbe "All our European experiments," he writes, "in social science have taught us the unwisdom of demolishing old world fabrics, which no one is yet prepared to replace by anything else Caste, for instance, looks unnecessary and burdensome, it is wildly

abused by Europeans, to whom the Brahmanic rules of behaviour seem unmeaning and unpractical but these things will tumble quite fast enough without our knocking at their keystones by premature legislation

We have ourselves to overcome the rather superficial contempt which a European naturally conceives for societies and habits of thoughts different from those within the range of his own ordinary experience and also to avoid instilling too much of the destructive spirit into the mind of Young India remembering that for the English and Natives the paramount object is now to preserve social continuity Dr J N Farquhar who thinks that the religious basis of caste is dead or dying under the stress of modern conditions freely concedes that caste during the earlier stages did much good to the people who came into its fold First according to him it proved a thoroughly social institution being a great advance on the simple arrangements of the Aryans when they entered India. It sought to absorb the aborigines instead of destroying them as has been done in many lands. Secondly it has preserved the Hindu race and its civilization along with its family institutions But for this powerful protection Hindu culture would have been overwhelmed by the terrific political storms of the centuries and the race could have survived only in fragments. Thirdly caste did for many centuries in India the work which was done in Europe by the mediæval trade guilds Fourthly caste has also served to some extent the purpose of a poor law in India for the well to-do members of the caste fulfil in some degree at least the duty of providing for those members who have fallen into indigence

Right-hand and left hand castes

A point of some interest if not of importance in connection with caste is the origin of the distinction of castes into right hand and left hand This distinction is

found practically all over Southern India and is referred to in lithic inscriptions found in many districts of Mysore and Madras, dating from about the 11th century A D In this State, the agricultural, artisan and trading castes are termed *panas* or professions, which are 18 in number These *panas* are divided into two divisions called Bala-Gai and Yeda-Gai (corresponding to Tamil Valan-gai and Edan-gai) or Right and Left Hands A large number of castes belong to one or other of these divisions. Although the Right hand and Left hand factions are said to include only 18 trades, there are many castes which adhere to one side or the other, but their numbers do not seem to be taken into account All Brahmans, Kshatriyas and a few others are considered as neutral It is impossible to obtain authentic lists of the castes belonging to the two divisions The lists vary from locality to locality The following is one of those commonly given in the State —

Right Hand Divisions

Banajiga	Traders
Vokkaliga	Cultivators
Ganiga (Outothu)	Oil men who yoke only one bullock to the mill.
Rangare	Dyers
Lada	Mahratta traders
Gujarati	Gujarati merchants
Kamati	Labourers
Jaina or Komati	Jain traders or Komati traders.
Kuruba	Shepherds
Kumbara	Potters
Agasa	Washermen
Bestha	Fishermen
Padmasalo	A class of weavers
Nayinda	Barbers
Uppara	Salt makers
Chitrigara	Painters
Golla	Cowherds
Holeya	Agricultural labourers

Left Hand Divisions

Panchala comprising —	
Badagi	Carpenters
Kanchagara	Copper or brass smiths
Kammara	Iron smiths

Kalkuliga	...	...	Stone masons etc.
Kansal	...	...	Gold smiths.
Uheri	...	...	A class of Nagarta traders.
Devanga	...	...	A class of weavers
Heggandas	...	...	Oil men who yoke two bullocks to the mill.
Golla	...	...	Cowherd
Bedu	...	...	Hunters.
Yakula or Toreya	...	...	Cultivators or a class of fishermen
Palli or Tigala	...	...	Market gardeners
Madiga	...	...	Cobblers.

The Telugu Banajigas and Linga Banajigas are the recognized heads of the right hand division According to them, all the eighteen *panas* enumerated above belong to them, and the nine *panas* of the left hand are separate The Panchalas and Nagartas who are at the head of the left hand section contend that the eighteen *panas* are equally divided between the two factions and that the nine enumerated above belong to them However this may be the origin of the distinction is buried in obscurity According to one tradition it arose from the fact of the Goddess Kali at Conjeeveram placing certain castes on her right hand and certain others on her left The parties have ever since disputed as to the relative honour accorded to each side. Mr Rice in the last edition of this *Gazetteer* suggested that the division was apparently a comparatively modern one as no mention of it is to be found in any ancient work except for a doubtful passage in the *Mahawanso* The Abbe Dubois took a similar view Another writer puts forward the suggestion that the distinction was the creation of a Chola King Recently Sir Edward Gait has suggested that the division may be a survival of a dual exogamous grouping which existed before the development of the caste system There is also a right-hand and left hand division of Sakti worshippers, the rites of the former being principally magical of the latter bloody and licentious. But as pointed out by Dr W H Wilson there seems to be no connection between the cases As the Abbe Dubois

points out, the division is mainly a struggle for precedence between the artisans and the traders, or between the followers of the old established handicrafts and innovators who brought in exchange of commodities with other parts supported by producers and ministers of luxuries Whether this is so or not, each party undoubtedly insists on its exclusive rights to certain privileges on all public festivals and ceremonies, and it not infrequently happens that one side usurps the supposed and jealously guarded rights of the other On such occasions, a faction fight is sure to occur "Perhaps the sole cause of the contest is the right to wear slippers or to ride through the streets in a palanquin, or on horseback during marriage festivals Sometimes, it is the privilege of being escorted on certain occasions by armed retainers, sometimes that of having a trumpet sounded in front of a procession, or of being accompanied by native musicians at public ceremonies Perhaps it is simply the particular kind of musical instrument suitable to such occasions that is in dispute, or perhaps it may be the right of carrying flags of certain colours or of certain devices during these ceremonies" The Abbè Dubois, who writes thus, adds that he had on several occasions witnessed popular insurrections excited by the mutual pretensions of the two factions "I have sometimes seen these rioters," he says, "stand up against several discharges of artillery without exhibiting any sign of submission" These faction fights figure prominently in the Madras Records of the 18th century They have gradually disappeared under the civilizing influences of education and good government, and, if they ever occur at all now, are confined to the lowest castes forming them and never spread beyond the limits of a village The distinction between the two factions, however, still exists, though it is of no great practical interest, whether from the social or administrative point of view

General characteristics of Mysore castes

We may note a few of the general characteristics of the Mysore castes and tribes before we notice the more numerous of them in detail So far as enquiries have gone there is no evidence among any of them of the general existence at some time in the past or now of Polyandry

Mother Ri

Evidence of the existence however at one time of *mutterricht* (or mother right) is traceable among several of them Under this system often called the Matriarchate descent was traced and property transmitted in the female line. Among many castes and tribes in the State a man s family is actually sought to be continued at the present day through a daughter who lives in his house This is so among the Kurubas Bedas Vaddas, Dombars Madigas Holeyas and Sillekyatas Among most of these when there are no sons born of the marriage, adoption is hardly ever resorted to Instead the lineage is perpetuated through the daughter The daughter, in this case is not given away in marriage as usual but is dedicated to the God or Goddess—Saivite or Vaishnavite according to the caste of the family – and turned into what is known as *Basavi* This term literally meaning "She bull, carries with it the import of Procreator This name has been given because she raises progeny for the family A Basavi after dedication usually remains in her father s house and can consort with any one belonging to her own caste or a superior caste Her children belong to her father and inherit direct from him She has herself all the rights of a son and in default of sons inherits all her father s property Her issue not only inherit her father s property but are also deemed for every purpose—including marriage—legitimate The ceremony of dedication is essentially the same among all these castes The affiliation of a son in law in the family is also widely prevalent

Among the Holeyas, a resident son-in-law receives an equal share of his father-in-law's property with his brothers-in-law Among the Bedas, Vaddas, Gangadikara Vokkaligas, Morasu Vokkaligas, Gollas and a section of Ganigas, a similar custom (*Illatom* in Telugu, and *Manevalatana* in Kannada) is found to be prevalent It is rare among Komatis but is not altogether unknown. According to this custom, when a man has no sons, a daughter is married to a man who agrees to become a member of the family and who thereafter resides in the father-in-law's house and inherits his estates for his children *Illatom* literally means "*acting the son of the family*" A son-in-law thus affiliated gets a share in the property equal to that of the son and in the absence of any sons, becomes sole heir to the father-in-law A Basavi and an *Illatom* son-in-law, as such, perform the funeral obsequies of the father or father-in-law from whom they inherit

Among most castes and tribes in the State, the important position assigned to a woman's brother gives us a glimpse of the days when the family centred round the mother and her brother and not her husband It might be stated that the universal practice among castes and tribes of the State is for a man to ask for the hand of his sister's daughter either for himself or for his son It is a binding custom among the Korachas that the first two daughters of a woman must be given at a reduced bride-price to her brother to be married either by himself or to his sons If he has no sons and does not himself stand in need of the girls for marriage, his right to them is exercised by his getting two-fifths of the bride-price payable for each of them at their marriage The usual bride-price in the caste -- 20 Pagodas—is reduced to 12 pagodas if the maternal uncle takes the bride Among the Vaddas, the bride-price varies from Rs 7 to Rs 15 according to family custom, but this amount may be

compounded for by the bridegroom agreeing to serve his father in law till he begets a female child and presents her to his brother in law

Among the Sanyasis very often the son in law lives in his father in law's house until he becomes a father of two or three children before he settles down separately The right to a sister's daughter is not lost even when the sister lives unmarried in her father's house In such a case, the brother does not himself marry such a sister's daughter but he has no objection to take her in marriage to his son. The maternal uncle, indeed has to be consulted in regard to the marriage of his nephew or niece and not infrequently he himself makes all the arrangements necessary in connection with it Among the Kurubas Agasas Helavas Billekyatas Kumbaras Sadas Idigas, Nayindas Tigalas Banajigas etc it is the right and duty of the maternal uncle to cut the chief post of Kalli (*Euphorbia Tirukalli*) required for erecting the marriage booth It is this post which ensures, it is said, the continuity of the line Similarly among the Koruchas the maternal uncle cuts a Nerala (*Jambolana*) tree. Among the Holeyas, the *tali* is tied to the bride by the maternal uncle Among the Komatis a portion of the presents made to the bride must go to the maternal uncle and another portion to the bride's sister Among the Sales and Nagartas a Peepal branch is cut and brought by the maternal uncle for erecting the marriage booth and he is paid Rs 4 8-0 for his trouble Among the Idigas and Telugu Banajigas, the duty of tying the chaplet (*Bhasingha*) to be tied to the bridegroom's forehead is done by the maternal uncle Among the Kumbaras a chaplet thus tied can only be removed by the maternal uncle. Among the Kumbaras the bride is brought to the marriage booth by her maternal uncle So also among the Helavee and the Gangadikara Vokkaligas.

Among the Morasu Vokkaligas, the maternal uncle ties the fringes of the cloths of the bride and bridegroom as soon as the *tali* is tied and they then exchange rice and salt, a sign of swearing mutual fidelity Among the Kadu Gollas the bride-price is made over by the father, on payment, to the maternal uncle Among the Medars, the bride is a second time given away by the maternal uncle Among the Madigas, the bride and the bridegroom are each lifted up by the maternal uncle who circles round three times with the burden and each bows towards the Sun, and upsets a jug of water (kept close by) by kicking it The couple are then carried inside the house and deposited on the marriage dais The maternal uncles are each presented with a turban, 12 betel leaves, 12 nuts, one cube of jaggory and four pies This ceremony is called *Bimaga* or *Serebidisuvadu*, *i e*, release from bondage Among the Tigalas, no marriage can be agreed to without the maternal uncle consenting to it A parent so agreeing is tried by the caste Among the Komatis, the maternal uncle's daughter is claimed as of right by his sister The phrase *Komati Menarikam*, literally meaning the *Komati's maternal relationship*, is a well-known one. It really means a relationship from which there is no escape Where a man has no daughter to give in marriage to his sister's son, he has to secure one for him Indeed, this prominence at marriages of the maternal uncle, the claiming of the milk-price (lit Breast-milk wages) among certain castes and tribes by the mother, besides the bride-price, which originally went wholly apparently to the mother's brother and now only partially goes to him, and the practical obliteration of the father and his rights during the time the marriage lasts—all these show that in ages past, the mother and her brother possessed rights which later were usurped by the father

Pre-marital communism.

Among the majority of castes and tribes a great deal of freedom is allowed between the sexes prior to the marriage so long as they confine their amours to members of their own or a superior caste Most castes strictly prohibit intercourse between persons of the same exogamous group but it none the less occasionally takes place In such a case, the usual practice (as among the Vaddas) is to make the man pay a fine to the caste which is double the usual amount and to require him to marry her If he declines to do so he is put out of caste and she is allowed to marry any other person Among the Holeyas sexual license before marriage is connived at or at least tolerated If a young woman remains unmarried in her father's house she may entertain casual visitors, and if she forms a permanent connection thus the man may tie a *tali* to her The usual bride-price has to be paid and the issue of such a marriage is considered legitimate even though they were born before the tying of the *tali* In some places, an unmarried girl might with impunity live with any caste man but if she becomes pregnant she has not only to marry her lover (unless he rejects her) but has to pay to the caste a fine of Rs 8 The man is also fined by the headman who may require the man to marry the girl If he refuses he is put out of caste The woman has then the right to take another man the betrayer being compelled to compensate her by paying Rs 25 and giving her a suit of clothes. Very similar customs prevail among the Madigas Gangadikara Vokkaligas, Idigas Upparas Kumbaras and Handi Jogis Among the Koramchas, a woman may remain unmarried without incurring any social odium But if she has a secret lover she must disclose his name and marry him if he is a caste-man after paying a fine to the caste. If he is of a superior caste he is thrown out of caste Among the Tigalas a man may consort with a woman of any caste except the lowest such as a Holeya, Madiga etc and his

children are reckoned as Tigalas Among the Dombars, sexual lapse before marriage is proverbial

Post-marital license

Though chastity of the wife is generally valued and is, as a matter of fact, the rule among most castes and tribes, great freedom is known to prevail within the limits of the caste among them Among the Kurubas, adultery on the part of woman with a man of the same or a higher caste is condoned by the tribal head, but if the man who receives her favours be of a lower caste, she is put out of the caste She is compelled to remove herself to the Madiga quarters and cattle-horn and bones and margosa leaves are thrown into her house, evidently to show that she has become as low as the Madigas in the estimation of her *quondam* castemen Among the Bedas, Agasas, Besthas, Tigalas, Morasu Vokkaligas, Idigas, Uppaias, Kumbaras, and Medars, if the husband has no objection, a wife's adultery may be expiated for by the payment of a fine to the caste. Among the Korachas, sale or mortgage of wives is not uncommon Among the thieving section, the children born to a married woman through *liaison* during the time her husband has been away serving his sentence in a jail are acknowledged as his own by the latter after he returns home A similar custom is prevalent among the Banjaras In the same caste, the wife is in fact not infrequently considerably older than the husband by reason of the man not foregoing his right to the hand of his sister's daughter In consequence of this custom, the women are allowed to cohabit with near relatives, the husband acknowledging the children born by such connection as his own Among the Lombars, elopement after the marriage of a woman is common and is expiated by the payment of a fine to the caste, besides reimbursement to the husband of his marriage expenses Among the Madigas, it is said that a wife who is living with a person other than her lawful husband may, after

the lapse of some years be reconciled to her husband and go back to his protection with any children which may have been born to her in the interval. A somewhat similar custom prevails among the Handi Jogis. Among many other castes—such as the Gollas, Killekyatas, Mondarus, Helavas and others—infidelity on the part of a wife is condoned by the husband and the caste panchayets only inflict nominal fines.

Marriage being a religious sacrament among orthodox Hindus—Brahmans and those following their customs in this matter—divorce as such does not exist, though infidelity might mean expulsion from the caste to a married woman. Among the others, however, divorce is both simple and easy. Divorce can be brought about at the instance of either party for infidelity on the part of the wife or incompatibility of temper between the parties or loss of caste by either party. A fine is usually paid to the caste by the party adjudged to be at fault. In either case the wife has to return to her husband the *tali* tied to her on the marriage occasion, also the jewels if any presented to her then, as also the bride price and the marriage expenses incurred by the husband in case she marries another man. In case she marries her paramour the bride price and the amount of the marriage expenses of the previous husband will be collected from him. Such a marriage is always in the *Kudike* form. The bride price paid for a divorced woman varies but is usually considerably less than the regular bride price. It is said that after divorce the parties cannot reunite if they wished to do so. Divorce.

Though both Hindu Law and usage allow a man to take as many wives as he desires, it is only rarely that a man of any caste or tribe takes advantage of the privilege. The special reasons that might sanction a second wife Polygamy.

are the failure of the first to bear a son, or her affliction by an incurable disease or infirmity. In such cases, not only the consent of the first wife but also of the caste is necessary Usually the wife herself moves first in the matter and arranges for the second marriage of her husband She not infrequently encourages her husband to take a second wife to save the family from extinction Where a sister of the first wife is available, she is usually taken in marriage as the second wife, the first wife playing the part of a kind mother to her in her husband's house Some amount of compulsory polygamy prevails among certain castes (for example the Banjaras) owing to the practice which prevails amongst them of expecting a man to marry her elder-brother's widow Among most castes (*e g*, Kurubas and Holeyas), it is usual to discourage polygamy by levying a fine on the party guilty of it When a man marries a second wife, while the first one is still alive, he is made to pay *Savati Hana* (or co-wife's price) which is sometimes about half as much again as the bride-price prevalent in the caste

Widow remarriage

Among the higher castes, widows do not remarry as marriage is considered a religious sacrament This theory, however, has not permeated the generality of Hindu castes and tribes in the State Among those who do not remarry their widows are the Komatis, Kadu Gollas, sections of the Idigas, Nayindas, Devangas and Kumbaras, the non-Lingayat Sadas, Nagartas, Banajigas (except the Mannuta section, who are regarded as being low in the social scale) and the Ganigas, the Gollas, Morasu Vokkaligas and Kunchigas, stand in a midposition These discountenance widow remarriage, but if a widow chooses to remarry or live with a widower as his concubine, she is allowed to do so and her children form a *Salu* or branch of their own The members of the caste do not intermarry with them though they have no

objection to interdine Among some castes (notably the remarrying section of Kumbaras, the restriction as to intermarriage extends only to three generations after which *Jus Connubium* is restored Among the Kadu Gollas the feeling against remarriage is intense They indeed believe that a woman on losing her husband becomes the bride of their tutelary deity and so she can neither remarry nor be allowed to part with her bangles and *tali* which she is allowed to wear as usual Excepting among the castes mentioned widow remarriage is extremely common in the State Usually there is no restriction as to the number of times a widow can marry Among Vaddas Dombars Korachas and Hondi Jogis a woman re marries as many as seven times Among the Gangadikar Vokkaligas it is usual to remarry as many as three times. Some members of this caste believe that persistent remittant fever (quartan ague) is cured if the person suffering from it drinks water given by a thrice married woman. Except among the Banjaras a widow cannot marry her deceased husband's brother elder or younger Among most castes she cannot marry any agnatic relation of her late husband. The restriction is extended among a few other castes (*e g* Kurubas. Helavas Bedas Sanyasis, and Holeyas) to all persons belonging to the exogamous sept of the husband Among the Korachas however though she cannot marry her late husband's brother she may marry any one belonging to his division or sept. It is usual for the widow especially when she is young and without children to return to her mother's house before offering herself again for marriage Among the Idigas there can be no question of remarriage while the widow stays in her late husband's house. This right is however subject to certain conditions. These are that she should obtain the consent of her parents, the parents of her late husband and of the caste headman She should also hand over the children,

if any, by the first marriage, to her late husband's parents She should also, in some cases, return the jewels (including the *tali*) which her previous husband might have given her Among some castes (*e g*, Upparas) a further payment called the "release money" should be paid to the late husband's parents

Form of remarriage

When a widow marries her late husband's younger brother, as among the Banjaras, there is hardly any ceremony excepting that the new husband has to supply to his caste fellowmen betel and nut and provide for them a drink In other cases, there is a kind of maimed ceremony that is usually performed on the occasion This is known among most castes as *Kudike* (or commingling) as opposed to the *Maduve* (or marriage) in the case of a virgin bride Sometimes, it is called *Sirudike* or the commingling preceded by the present of a new cloth to the widow by her new husband Married women cannot take part in it, nor could the remarried woman make herself visible to any married woman for three days after her wedding Nor can she ever take part in the celebration of virgin marriages and other auspicious occasions The marriage takes place usually during the dark fortnight, on a day fixed, after sunset and often after darkness has set in, in the presence of the assembled castemen The bride usually bathes, puts on the new cloth given her by the new husband, who ties the *tali* to her after paying the bride-price usual in the caste The customary caste dinner follows Among some castes the ceremony is somewhat more elaborate, as among the Madigas, but the essential portion of the ceremony is the same A similar custom appears to prevail among the Sadas Among them, the marriage takes place in the new husband's village, to which the widow repairs She lodges in a temple for the time being The would-be husband goes there with some of

his castemen and presents her with a new cloth and a bodice cloth which she wears. Glass bangles are put on her wrists, and in the presence of the assembled caste men the man in some places a remarried widow ties the *tali* to her. Meanwhile the man's house is vacated and rendered dark for the occasion and the man himself is made to sit in a corner. The woman is conducted to this place and as soon as she enters it the man asks her why she has come there. She replies: I have come to light a lamp in your dark house. Then a light is lit and the whole function ends with a caste dinner.

Influence of religion

Though as we have seen above sexual license within the caste is tolerated to a certain extent still female chastity is highly prized among the generality of castes and tribes in the State. This may be due to long contact with a superior religion which has long inculcated the belief that marriage is a sacrament. Among those castes which have been largely influenced by this idea even widow marriage has ceased to exist. In some castes while it is favoured by some sections others look askance at it. Among Morasu Vokkaligas even child widows cannot remarry. Pre marital license is falling into disfavour. It is not tolerated among the Gangadi and Morasu Holeyas. Among them if a girl becomes pregnant before marriage, she is put out of caste. The odium lasts even after death and to ensure a proper burial of her body such a woman sets apart a sum of money, about Rs. 12 during her lifetime. Even among Banjaras pre marital intercourse is put down with a high hand. The Nayak of the Thanda had until recently power to subject the seducer in a case of that sort to ignominious treatment shaving his head on one side and parading him in the street on the back of a donkey. This, however, is now out of date and in its place, a heavy fine as much as Rs. 100 is imposed on the man,

who besides is made to pay compensation to the parents of the girl of an equal sum Among the Gaie section of the Uppaiias, a woman guilty of immorality is thrown out of caste Similar expulsion from the caste is the fate of a woman soiling the bed of hei lord among the Ganigas, Devangas, and Nagartas. Among many castes, though in theoiy a woman may iemain unmaiiied, she haidly ever does so, or is ever allowed to do so, as for instance, in Malabai Among ceitain castes, such a single state of blessedness has its penalties piovided ready for it Foi instance, among the Bedais and some othei castes, a woman dying without maiiiage is cariied by men without a bier and is interied like tender babes—in this iespect with the face downwards, no funeial ceremonies being observed To avoid tieatment of this kind among some castes (notably the Holeyas), a giil who cannot get maiiied from the absence of suitois, is maiiied to trees such as Honge (*Pongamia Glabra*), Ekke (*Calatiopis Gigantea*) or the Margosa oi othei inanimate object and dedicated to shrines She then may consoit with any member of the caste oi has all the iights of a son in her father's family Maiiiage is thus iendeied compulsory amongst the geneiality of castes Divoice, though easy, is not common There is thus ieason to believe that the relations between the sexes in the State aie becoming steadily moie iegular

Restrictions on marriage, linguistic, territorial and other

The restiictions on maiiiage aie many among the geneiality of castes and tribes A man must not maiiy outside the limits of his caste and if he is, as it often happens, a member of a sub-caste, he may not maiiy outside the particulai sub-caste, occasionally too, he may be able to take a giil fiom a paiticular sub-caste, but not give one to it It not infiequently happens he may and does maiiy with paiticulai sub-castes and not with otheis In the case of several castes (*e g*, Kuruba,

Holeya Agasa, Komati Uppara Kumbara Banjara Sada Handi Jogi Nagarta Telugu Banajiga and Devanga) linguistic territorial religious and occupa tional differences prove effectual bars to intermarriage. Among these religion (excepting the Lingayat which always creates a sharp line of difference) is seen to be the least harmful In a very few cases, very trivial differ ences in the mode of pursuing the same occupation lead to the creation of additional bars to marriage Thus among the Helavas, a begging caste found all over the State, those who use a metal bell do not intermarry with those who use a wooden bell Then, again the metal bells are divided into those who sit on a bull while begging and those who have given up the bull while going their rounds. The Besthas who live by agricul ture, fishing and palanquin bearing respectively form separate endogamous groups Similarly among the Gan gadikara Vokkaligas found in the western and southern parts of the State the mode of carrying marriage articles has led to the formation of two endogamous divisions— those who use open boxes and those who use covered boxes Occasionally differences in diet have had the effect of separating some members of the caste and making them a strictly endogamous unit by themselves Thus the Cheluru Gangadikaras, who are pure vege-tarians, marry only among themselves. Then again most castes are further divided into groups consisting of persons supposed to be descended from a common ancestor and so forbidden to intermarry A man is therefore exogamous as regards his family group and endogamous as regards his caste or sub-caste

While endogamy is the essence of the caste system exogamy is found amongst primitive communities all over the world and in Hindnism is, as Sir Edward Gait suggests, probably a survival from an earlier culture Descent throughout the State being traced through the

male, the general rule is that a man may not marry a girl of his own exogamous group In this State, contrary to what prevails elsewhere, the limits set by exogamy do not extend to the families of both the parents, nor do they extend to the families of a man's maternal uncle or paternal aunt Among most castes, as we have seen, a man marries his sister's daughter or has her for his son Cross-cousin marriage is the general rule in the State The connection between this and mother-right has been referred to above It is only in rare cases—as among the Komatis—that the rule of "turning the creeper back" as it is called, prevails According to this rule, known as *Eduru Menarikam*, a girl who has been married into a family cannot ever after give a girl in marriage to her father's family In the same caste, the rule that the bride and the bride-groom should not belong to the same *Gotra* (or sept) prevails Similarly we have already noted the fact that some castes allow a widower to marry his younger sister's daughter if he cannot otherwise wed As elsewhere among the Brahmans, these exogamous groups are generally eponymous, each group or *Gotra* being supposed to consist of the descendants of one or other of the Vedic Rishis *Gotras* with similar names are found among a few other castes (*e g*, Komati, Bestha, Sale, etc) but the exact nature of their connection to the groups professedly belonging to them is not clear It is possible that they trace their descent, not directly to the Rishis whose names they bear, but from their priests who originally administered to them and who belonged to these *Gotras* It may be also, as suggested by Sir Edward Gait, that they trace their descent from members who originally belonged to these *Gotras* This is one of those questions that still requires careful investigation, as indeed a great deal more of the many points relating to exogamy as practised among the castes and tribes of the State Our present knowledge does

not enable us to say how far exogamy is absolutely primitive and how far copied from other sources Many castes and even sub-castes have headmen of comparatively modern times as the reputed ancestors of their exogamous sections This is the case among the Banjaras, Nagartas Kadu Gollas Agasas, Tigolas Sanyasis and Idigas (among whom marital restrictions are of a most complicated character) Some groups are named after the places where the founders originally resided or are supposed to have resided Probably the origin of house names is to be explained on some such basis as this. This is especially the case among the immigrant castes such as the Dombars Idigas, Nagartas etc. Finally there are the totemistic groups which are found chiefly among castes of the tribal type Traces of totemism are also found among other castes as well but further investigation is necessary for any general inferences to be drawn from them For instance we cannot say from the evidence now available whether those castes which retain traces of totemism were originally tribes who slowly drifted into the orbit of Brahmanism If so, several castes, including the Holeya, Kuruba Bestha Bili Magga, Kadu Golla, Medar, Golla Kumbara Helava, Gangadikara Vokkaliga etc., were before their absorption into Brahmanism in all probability in the tribal state of existence with totemism in full swing among them. Totemism as it exists in the State is of the genuine type. The totem is usually some plant, or animal or an inanimate object (vegetable flower, sun moon stone, etc) now or until recently held in reverence by the members of the sept and associated with some taboo Among several of the castes mentioned above, those belonging to the same totem do not intermarry Among some castes, *Gotras* reminiscent of the Vedic Rishis have been adopted but as among the Besthas, who have adopted the Konndinya and Kasyapa *Gotras*

and the Sales who have adopted Markandeya as their single *Gotra*, the incorporation is meaningless, as they are not effective as bars to intermarriage. Among these, totemism, on the other hand, is not altogether dead and the association of Rishi *Gotras* with them seems to be an attempt at engrafting the Brahmanic system on to the decaying tribal ones. Among certain castes totemism is practically dead, such as Madiga, Handi Jogi, Mandaru, Sillekyata, Nagarta, etc. Among certain castes, only those living in particular areas (*e.g.*, Helavas in the Mysore District) Gangadikara Vokkaligas (in Mysore and Bangalore) have anything like totemistic septs, the others having lost them. Among non-Lingayat Sadas, there are the flower men and the *Pongamia Glabra* men, but this division has no significance in connection with marriage. It follows from this that those castes which do not now exhibit any traces of totemism might have practised it at one time though they dropped it later. Such dropping might have been in some cases, as among the Sales, Besthas, etc., preceded by the conversion of totem names into those of Vedic Rishis, for example, Kach Chap (Tortoise) into Kasyapa. Among the Komatis, among whom totemism is partially active, two or three totem septs are included in a *Gotra*. While the oneness of a *Gotra* is no bar to intermarriage, oneness of the sept is. This shows clearly that the addition of the Rishi *Gotras* is a recent attempt at engrafting two different systems of culture. The Devangas have adopted some Rishi *Gotras*, but the fact that some of these are not of the Vedic type is rather significant (*e.g.*, Bhaskara, Pippala, Malika, etc.)

Totemism.

The evidence, such as it is, warrants the general deduction that at one time totemism was widely prevalent among the people of the State. It has the usual beliefs associated with it here—those belonging to a

particular system profess to be descended from it, reverence it in daily life in a variety of ways and regard that those of the same totem (called locally Kula or Bedagu) should refrain from intermarriage. Such a connection is considered incestuous and brings on expulsion from the caste. Thus among the Kurubas, who are divided into a large number of totemistic septs, the commonest totems are among animals, the she-buffalo and the goat which are neither killed nor eaten by members of the groups belonging to them and the elephant which they do not ride; among trees, the Banyan, the Indian Fig, the *Ficus infectoria*, the wood apple, the *Prosopis Spicigera* the Margosa, the sandal wood tree, the *Pinus Deodara*, the peepul, the tamarind, the *Phyllanthus Emblica*, etc., which are neither cut nor burnt nor their products (oil or cake in the case of Margosa) used, nor indeed would the people belonging to the septs named after them consent to sit under them or cross their shadows; among plants, the kitchen herb, the *Celosia Albida*, and the *Phaseolus Radiatus*, which those belonging to them abstain from eating; jasmine, pepper, *Calatropis Gigantea* which those belonging to them refrain from cutting, cultivating or using; among the heavenly bodies, the sun and the moon; among other living beings, the ant, the fish, the cobra, the peacock, the rabbit and the scorpion; and among other inanimate objects are drum, the cage, cart, silver, gold, flint stone, arrow, knife, bier, pickaxe, Bengal gram, pumpkin, pearl, ocean, pestle, glass bangles, conch-shell, salt, weavers' shuttle, etc. In the case of all these, the object after which a totem is named is not used. For instance, as regards the gold and silver and glass bangle septs, the women belonging to these septs do not use jewels made of these precious metals or use glass-bangles, but instead wear bell-metal ones. People of the sun sept will observe some sort of fast if the sun does not appear as usual and even pray

for his appearance; in the case of the cobra, scorpion, etc., they are not killed but are left off when observed. People of the pestle sept, do not use it but have instead a wooden hammer. The saffron and horse-gram septs have transferred their allegiance to the panic seed and the jungle pepper as these things are of every-day use. All the same, the people of these septs do not grow saffron and the horse-gram. The Holeyas have very similar totems, besides the earth, the crow-bar, the plantain, the cuckoo, the oil mill, lightning, pigeon, peacock, betel leaf, etc. Those belonging to the sept Nagale, a kind of thorn, do not when pierced by a thorn pull it off themselves but request one of another sept to help them out of the difficulty. Among the Bedas, similar septs prevail with some few additions, bug, net, ox, the seven mountains (of Tirupati), etc. The Besthas have besides septs named after Coral, etc.; the Komatis have as many as 101 septs including the lotus, the lime-fruit, the gourd, bamboo, brinjal, cardamom, camphor, etc. The Bili Maggas are said to have as many as sixty-six including the Brahman Kite, milk, the *Pandamus Odorotissima*, horse, sparrow, tank, paddy, rope, etc.; the Sales have an equally large number of totems including dagger, drum, mountain, nail, indigo plant, etc.; the Vaddas, likewise, have septs some of which are the pig, mortar, margosa, salt, buffalo, etc.; the Nayindas have the horse, *pongamia glabra*, jasmine, peacock, saffron, chrysanthemum, *Achryranthus aspera*, etc.; the Kadu Gollas have three primary exogamous septs, two of which are named after the bear and the moon, each of these being again sub-divided into different exogamous septs, the first of which includes the bear and the pot; the second among others of the moon, the he-buffalo and the milkhedge and the third includes the pestle, gram, hoe, etc.; the Morasu Vokkaligas have a varied number of totems of which may be mentioned the banyan, wood

apple, pomegranate, *pongamia glabra*, the bastard teak, plantain, *bassia latifolia*, mango, cocoanut among trees: the elephant, jackal, goat and the tortoise among animals; jasmine and chrysanthemum among flowers; black among the colours (men of this sept do not keep black bullocks and the women belonging to it do not wear black bangles or black clothes) and the ant-hill and conch shell and silver among inanimate objects: the Madigas, among whom totemism seems to be decaying, possess among other totems, silver, bow, umbrella, ant, gold, butter, bear, tortoise, jasmine, tiger, saffron, etc.; the Gollas have monkey, spotted cow, saffron, peafowl, peepul tree, mustard, lion, horse-gram, deodar tree, gold, sandal, etc.; the Upparas own a large number of totems which are the palanquin, elephant, saffron, moon, umbrella, coriander, *pongamia glabra*, pearl, jackal, jasmine, dagger, etc.; the Helavas living in the Mysore District possess among others the peepul tree, cobra, banyan, mortar, pestle and light, which last, those belonging to it do not extinguish by blowing it out from the mouth; the Gangadikara Vokkaligas living in certain parts of the State have totems which include the moon, silver, gold, buffalo, cat, *pongamia glabra*, fig tree, etc.; and the Lingayat Sadas are divided into as many as thirty-three septs some of which are the areca-nut, pigeon-pea, butter, cobra, stone, chrysanthemum, jasmine, lime-fruit, etc.

Except among the Brahmans and those closely following them in this matter, *e.g.*, Komatis, Sales, Namadhari Nagartas, etc., marriage is usually adult. Among most, however, it may be before or after puberty, though it is generally after. Among the Brahmans, the tendency to postpone marriage as much as possible is very pronounced. The Infant Marriage Regulation has to some extent checked the inordinate desire to marry mere infants so much prevalent at Marital age.

one time among Brahmans, Komatis and a few other castes.

Forms of marriage: (a) Purchase of bride.

Among the Brahmans and those following them, *e.g.*, Nagartas, the all but universal rule is to give away the bride as a gift to a suitable bridegroom. The bride too is decked in jewels before being presented at the expense of her parents. Similarly, until recently, the bridegroom who pretended to be a pilgrim student on his way to Benares, was not paid for by the bride's parents. But for some years past, with the increase in the cost of education and competition for well-educated sons-in-law, the habit of paying—sometimes heavily—for them has come into existence. In this State, there are instances of payments ranging from Rs. 500 to Rs. 2,000 and even more for an educated bridegroom. A more refined feeling is beginning to show itself, but it will be some time perhaps before it can become anything like strong. Among the other tribes and castes, it is the bride that is always paid for. The amount varies with each caste, from Rs. 12 among the Tigalas to as much as Rs. 500 among Lingayat Ganigas and Devangas. Most castes, however, are content to bide by the ancient custom in the matter and do not arbitrarily raise the amount. This amount apparently was much more at one time than now, if some of the stories current among some castes and tribes are to be believed (*e.g.*, Korachas, Banjaras, Gollas, etc.); but owing to changed circumstances, it was lowered to enable people to marry at the proper age. The usual amount among the generality of castes is somewhere between Rs. 12 and Rs. 24 (*e.g.*, Kuruba, Holeya, Beda, Bestha, Vadda, Nayinda, Dombar, Kadu Golla, Sanyasi, Madiga, Idiga, Medar, Golla, Uppara, Telugu Banajiga, etc.). Among the Bili Magga and Sale castes, it is Rs. 24; the Kurubars pay from Rs. 25 to 50; the Gangadikara Vokkaligas pay from Rs. 20 to 35; and the

Handi Jogis from Rs. 10 to 40 and one pig. Among the Korachas, it varies from Rs. 60 to 72 and as the amount is far too high for their means, it is not uncommon among them to spread its payment over a number of years. The Mondaru's pay only Rs. 6, the Helavas from Rs. 9 to 24 and the poorer Devangas from Rs. 9 to 21. There are hardly any cases in which the bride-price is excused in any caste or tribe except (1) where the bridegroom is either the maternal uncle of the bride, or where the maternal uncle, if he himself does not marry the girl, takes her for his son, where the usual amount is reduced by one half and sometimes even excused altogether; (2) when a widow marries her husband's younger brother (as among the Banjaras), no bride-price is paid; (3) where the bride is a widow and the person marrying her is a widower, then the price is reduced by one half; and (4) when there is an exchange of daughters between the marrying families, the bride-price is altogether excused on both sides. On the contrary, when a widower desires to marry a virgin, he has to pay a higher price. Sometimes this is twice what is paid ordinarily for her, besides the *Sawati Hana* or the co-wife's gold. Half the price is usually paid immediately the contract of marriage is settled and betel leaves and nuts are exchanged between the parents of the bride and bridegroom and the other moiety is paid after the *tali* is tied, *i.e.*, after the contract is turned into a sacrament. Where the amount is higher—double the usual amount—or near about, as among the Idigas, the sale is apparently taken to be an absolute one and the girl has, therefore, to be sent to her husband's house at once and the latter might refuse to send her back to her father's house, which he could not if the smaller amount was paid, being in that case bound to send her whenever her father went to fetch her. Sometimes, as among the Kurubars, where the amount to be paid is heavy, its payment is spread over a number

of years. Occasionally, when the bridegroom is too poor to pay anything either immediately or in the near future, he is allowed to work in his prospective father-in-law's house, be fed and clothed by the father-in-law. There is no period of service fixed but usually—as among the Vaddas—the son-in-law should serve until he begets a female child and presents her to his brother-in-law. The amount of price paid, whatever it is, goes usually to the bride's mother, father or brother. But it seems fair to conclude that this was not always so. Apparently the amount originally went to the maternal uncle of the bride. Among the Korachas, when the maternal uncle does not take the girl for himself or his son, he usually gets two-fifths of the price paid for her transferred over to him in the case of the first two daughters. Among the Kadu Gollas, again, the amount is taken by the father and handed over to the maternal uncle, which shows that he is rightly the person entitled to it. These and other customs pertaining to bride-price show that as the filiation changed from the mother to the father, the devolution of the price paid also changed in the same direction. This change is daily getting more and more confirmed among the urban castes by reason of contact with higher castes, who usually do not pay any price whatsoever for a bride. It may, indeed, be said, that among some castes, the bride-price though paid, is usually converted into a jewel by the parents of the bride and returned to her as such. This is so, for instance, among the Morasu Vokkaligas and the Telugu Banajigas and a section of the Devangas. Among these, it may be justly remarked, that the taking of the bride-price is getting into disfavcur.

(*b*) Relics of marriage by capture.

There are a few traces of marriage by capture among certain tribes and castes. Thus, among the Bedars, Agasas, Nayindas, Idigas and Handi Jogis, a mimic fight

between the bridegroom's father and the bride's father, in which the indiscriminate throwing of half pounded rice is prominent, is a regular feature of the usual marriage ceremony. It is the bride that is sought to be captured, the fight customarily taking place at or near the bride's house. On these occasions, the bridegroom usually carries a dagger in his hands and is accompanied by his party who are met by the bride's party, and the mimic fight ensues immediately the meeting takes place. The bridegroom's party is taken next into the marriage booth to which the bride is brought in and placed opposite the bridegroom with a cloth as a screen between the two. At the moment the priest draws off the cloth, the bride and the bridegroom throw on each other some jaggery and cumin seed or rice, the girl, if too young or small in stature, being held up by her maternal uncle or other near relative. This apparently indicates the easy surrender of the bride after the simulated fight. One or two curious customs prevail among certain castes which might probably be relics of marriage by capture. Thus, among some of the Holeyas, five men from the bridegroom's party go to the bride's house and tie the *tali* round the neck of the bride and return to the village where the bridegroom is kept waiting all alone in a room outside the house known as *Devaramane* (or God's house). The bride comes on horseback, alights near the *Devaramane* and goes into the room occupied by the bridegroom. A cloth separates the girl and garlands are mutually exchanged. The men and the women present then throw rice on the heads of the pair. Have we here a simulation of the capture of a bridegroom by the bride? Among the Madigas, as the bridal pair come out of a room after the customary dinner, the maternal uncles of the bride and the bridegroom intercept them at the threshold and beat them with whips of twisted cloths Among the Handi Jogis, as the bridegroom and his party

approach the bride's place, they are stopped by a party of the bride's relations who hold a rope across the path. After a mock struggle in which he is worsted, the bridegroom pays down a rupee to his opponents who thereupon permit him to pass into the marriage booth. Among the Banjaras, when the couple are led to the marriage booth, the bride shows considerable resistance and is forcibly led to the place by an elderly woman. The couple then go round the milk-post three times, the bride all the while weeping and bowling. In the same manner, the couple pass round the second post three times, after which the elderly woman retires. The husband once again passes round the post with the bride. Her resistance is now redoubled and he has almost to drag her by force. It is this which constitutes the binding or the essential part of the ceremony in the caste.

Marriage ceremonies, etc.

Among the generality of castes, the marriage ceremonies are elaborate and last usually for five days. The marriage in the majority of cases takes place at the bride's place, though sometimes, as among the Dombas, and a section of the Holeyas, it is also performed at the bridegroom's. Among the Kadu Gollas, however, marriage is looked upon as an impure affair and it takes place only outside the hamlet. Those who attend a marriage do not enter their houses without bathing in a tank. The marriage ceremonies include among most castes various items, the chief of which are the *Vilyada Shastra* (betel ceremony) which fixes the contract between the parties; the *Devadruta* which invokes the blessings of God and the dead ancestors on the couple; the *Chapra* (or the *Elevasa*) which is the erecting of the marriage booth in which the maternal uncle of the bride plays an important part; the *Tali* tying which turns the contract into a sacrament; the *Dhare*, the pouring of the

milk over the couple which is caught in a vessel and thrown over an anthill afterwards; the *Sase*, the pouring of handfuls of rice by married couples on the bride and the bridegroom; *Bhuma*, the eating together of the newly married couple; the *Nagavali*, the searching of two vessels containing red coloured water; the *Kankana Visarjana*, the untying of the wrist bands from off the hands of the couple; and finally the *Gaddige* (or *Simhasana Puje*), the worship of the throne, at which the members of the 18 and 9 *phana* communities are in the order of seniority shown respect by the distribution of betel-leaf and nuts. Among some castes a few more items may be found to exist, but the above may be taken as forming the principal ones in a typical marriage celebrated among most castes in the State. The binding portion of the marriage is invariably the tying of the *tali* followed by the *Dhare*. The *tali* is in most cases tied by the bridegroom. This apparently seems a later innovation. Originally it seems not improbable that it was tied, as even now among the Holeyas, by the maternal uncle. This custom, however, has entirely fallen into desuetude and the bridegroom has taken the place of the maternal uncle. The *tali* is usually a round disc of gold made flat or convex like a shallow inverted cup with a small button at the top. A string is passed through a ring attached to it and it is tied so as to hang round the neck. Among the Telugu speaking immigrant castes, the string is also woven with black glass beads on each side of the *tali*. Among the Banjaras, as we have seen, going round the milk-post is the operative part of the ceremony. This circumambulation of the milk-post is performed by most other castes, but it nowhere assumes the importance it does among the Banjaras.

Other minor characteristics.

Every caste has its own occupation, and its status is well defined in Hindu society. Each caste or tribe

has also its own peculiar religious and social observances, though those which desire to seek a higher status in the social scale have not been altogether unwilling to adopt and even assimilate customs and practices hitherto largely, if not solely, identified with the Brahmans as a caste. This has been especially so in regard to marriage, including early marriage of girls before puberty and enforced widowhood and ideas of ceremonial pollution. Most castes have some account of their origin, sometimes the stories given out being most fanciful and betraying an evident anxiety to get into the hallowed circle of Hindu society. Brahmans, as a general rule, do not in this part of India take water or articles of food baked, boiled or fried in ghee from persons of other castes. Most castes, however, are willing to take food prepared by Brahmans or Lingayats. Generally speaking, it may be said that it is not considered derogatory for Brahmans to minister to the spiritual needs of other castes considered fairly high in the social scale. Most castes, however, have their own priests and among Lingayats, none but their own priests can officiate at marriages, funerals, etc. Among some castes, the custom of admitting outsiders prevails, for example, Agasa, Beda, Holeya, Madiga, Nayinda, etc. A purification ceremony precedes the admission and is held before the caste elders. It is usually followed by a caste dinner to which the new admittant is a party. Usually, the admittant is a person regarded by the caste in question as belonging to a caste higher than itself in the social scale. Caste titles vary but as already remarked, the tendency to appropriate some particular ones by those not really entitled to them is common. Caste Government of some kind is universal though its power and jurisdiction have been largely taken away from them by the Civil Courts, the tendency towards individualism which has made itself felt to an increasing extent in recent years, and the general

relaxation that has followed the emancipating tendencies of the western influences. At present, it may be said, caste tribunals have little to do with the disputes relating to property, inheritance and occupation. Their jurisdiction usually extends to questions relating to food, marriage, admission of outsiders into the caste and like matters which purely affect the particular caste as such and its general status in the accepted social scale. These tribunals are of two kinds. One is presided over by the Swamis of recognized mutts (religious orders), such as those of Sringeri, Uttaradi, Vyasaraya, etc., among Brahmans, and the Murgi Mutt, etc., among the Lingayats. These have Agents all over the State and they are recognized on all ceremonial occasions, such as marriages, funerals, etc. They collect the fees and remit them to the mutts concerned, report cases of delinquency to them and obtain their decisions on them for general promulgation among the castemen concerned. The other sort of caste tribunal is the Headman of the caste resident in each village, who decides every dispute as it arises, the chief headman being referred to only on important occasions, (*e.g.*, Kuruba, Golla, Beda, Morasu Vokkaliga, etc.). The office of the Headman is hereditary. Headmen of castes which belong to the Right Hand and Left Hand castes make use of a beadle in convening assemblies in their jurisdiction known as *Kattemanes*. The Headman, called variously Gowda, Setty or Yajaman, is usually assisted by his Deputies (as among the Bedas) or by Assessors (called *Buddhivantas*) in his work (as among the Vaddas). The parties are summoned and heard after they have been duly sworn in after the manner customary in the caste concerned (swearing by the Vibhooti or consecrated ashes after placing it on a Kumbli and making puja to it as among the Kurubars and swearing by *Janjappa* or sacred sheep as among Kadu Gollas). Then evidence is next heard and sentence pronounced. For ordinary

offences. a fine is the usual sentence. Marrying out of the endogamous unit is followed not infrequently by expulsion from caste. Some castes which are numerically strong have a more developed caste organization. Thus among Morasu Vokkaligas, several *Kattemanes*, each presided over by a Gowda or Yajaman, form a Nadu (division of country) at the head of which is a Nadu Gowda. Several Nadus form a Desa (country) presided by a Desa Gowda. There are two such, one at the head of the Telugu section and another at the head of the Kannada section of this caste. That these officers were at one time connected closely with the Civil Administration of rural areas and that even women could be Nal-Gowdas or Nad-Gowdas may be inferred from inscriptions.

Funeral ceremonies.

The dead are either buried or cremated. Cremation is universal among Brahmans, Banjaras and Komatis. The priestly section among the Helavas and other Vaishnavite Nagartas also burn their dead. Sometimes aged men among the Holeyas are also cremated. Those dying from contaminating diseases like leprosy, etc., or from wounds inflicted by wild beasts and pregnant women are, even among castes who usually bury, cremated. Among some castes—*e.g.*, the Upparas, Vaddas, Dombars, Madigas, Agasas, Telugu Banajigas and a few others—in such cases, the body is disposed of by what is known as *Kallu Seve* (or stone-service). This consists of the body being placed on suitable ground and being heaped over with stones so as to form a mound. The generality of castes bury their dead with the head turned to the south. Lingayats and those who have come under their influence, *e.g.*, Ganiga, a section of Kurubars, a section of Bedas, Silwanta Nayindas and a few others, bury their dead in the sitting posture. The Lingayat-Devangas however, bury in the lying posture. On the other hand, Vaishnavite Holeyas bury their dead in the sitting posture.

Pollution lasts for a period ranging from 10 to 15 days. Most castes, including those who do not offer annual oblations, observe the Mahalaya new moon day as a day sacred to the dead. Among the Morasu Vokkaligas, the Holeyas of the Morasu section of that caste act as the *Hale-maga* (lit. old son) of the caste and play an important part in the burial ceremonials. In olden days, he was one of the four who carried the body, but now he walks before it. He also carries the news to relations, digs the grave, helps the chief mourner to set fire to the body and on the third day goes with the chief mourner to the burial ground and partakes of part of the food remaining over after offering is made to the spirit of the dead person, the remaining portion being thrown to the crows. Among many castes which bury the dead, the custom of planting a stone, about two feet high, over the grave prevails fairly widely. The building of Brindavanas and the setting up of Lingas by the Vaishnavas and the Saivas, respectively, is also not uncommon in several places.

Some unusual or curious customs.

Among unusual customs prevalent in the State may be mentioned a few. The existence of Couvade among the Korachas is fairly well established. When a Koracha woman feels the birth pains, her husband puts on some of her clothes, makes the woman mark on his forehead and retires to bed in a dark room. The practice exists in remote parts in the Shimoga District and elsewhere and is reported to be dying out. The Myasa Bedas of Chitaldrug District practise circumcision. Whether they have adopted this custom from the Muhammadans has still to be cleared up. But it is significant that the pig is taboo to them as an article of food. As the circumcision of women is not practised by them, it may perhaps be inferred that it has been borrowed by them. Customs of this kind, moreover, are never indigenously evolved.

The Morasu Vokkaligas of Mysore formerly had a custom, now prohibited by the Government, whereby a woman, before the ears of her eldest daughter were pierced prior to her betrothal, had to suffer amputation of the ring and the little fingers of the right hand. Among the Vaddas, a man grows his beard until he is married and removes it at the time. During the pregnancy of his wife, a Vadda will not breach a tank or carry a corpse. The Kurubars of Mysore do not consummate marriage for three months, so as to avoid the risk of having three members of the family within a year of marriage, which is regarded as unlucky. Among the Kadu Gollas, a pregnant woman in labour is lodged far off from a village and only a Beda midwife is allowed near her. After three months, the mother and the child are brought in.

Caste in proverbs.

Sir Henry Risley has drawn pointed attention to the interest that attaches to the study of caste proverbs both as descriptive of the castes themselves or of the peculiar characteristics of those belonging to them. The Mysore Census Report for 1911 devotes a section to it and to it mainly I am indebted for what follows. Proverbs convey but half truths and are not infrequently caricatures of a particular failing in a caste or community. While they should not, therefore, be interpreted literally, there is no gainsaying the fact that they give us an opportunity to know how the different castes see or view each other. To take the Brahman first, he is never a pet with other castes. His cupidity is referred to in the saying "A Brahman's avarice;" his want of foresight in "A Brahman always thinks after the event;" his want of martial spirit in "To fight a bold Brahman," which is a recommendation to a cowherd who said that he could not fight an elephant or a soldier; his poverty in "Never stand before a Brahman or a horse;" the one will beg and the

other will knock; his habit of dining late in "Never a Brahman's servant or Ganiga's Bull;" his excessive waste in ceremonials in "The Brahman cares for Sraddhas, the Holeya for drink and the Vokkaliga for the fine;" his setting people by the ears in "A Brahman's presence destroys a village as that of a crab over a tank;" his unusual physical transformation in "Never trust a black Brahman or a white Holeya;" his desire for tasty food in "The Brahman is for a good meal." The Vokkaliga comes in as much for praise as for blame. "Agriculture not done by a Vokkaliga is no agriculture," but he "pawns jewels for a feast" and he is generally "friendless." The Komati is badly caricatured in many sayings. "A Komati's trick" is something too palpable to be just. "A Komati's secret" is one that would only be known after his death. His cleverness in account keeping is testified to in "The Komati may fail, but will never fail in his accounts." His general astuteness is referred to in "The Komati will never be deceived, and if he is, he'll never tell." That he is not taken to be the guileless individual he wishes to be taken for is probably hit at in "You can stand a Brahman's anger but not a Chetty's smile." His care for recompense is alluded to in "The Chetty never enters a flood unless there be a profit for the trouble." A general characteristic of the caste itself is, perhaps, referred to in the saying which styles it "The coriander caste." The Komatis as a caste, it would seem, would not yield unless threatened just as the coriander will not sprout up unless it is rubbed hard against a rough substance before sowing. The Kumbara's weary labour is pointed to in "It takes a year for a Kumbara but a minute for a stick." The Akkasale's wily nature is touched upon in "The Akkasale will not scruple to take from the gold given to him for work by his sister or mother." But that he is appreciated and patronized by all in the village is plain from "The Akkasale knows

whose ornaments are made of gold just as the Agasa knows the poor of the village." The Agasa's inveterate habit of appearing in the clothes of his constituents is ridiculed in "The Agasa is with his master's finery." The dirty habits of the Nayindas are betrayed in "One can dine out of an Agasa's hand but never in a Nayinda's courtyard." The Ganiga's hard-worked bull is referred to in "Never take a bull from a Ganiga." The Telugu Banajigas are described in "A Banajiga as small as a garlic tuber and the village is ruined." The nature of the Salè's task is well put in "A Salè is ruined by separating from his partner, while a Chetty is from having one." The Koracha's tenacity is alluded to in "Even if a Koracha is beaten, he won't give out the truth," which is very true. His cringing propensity in "To cringe like a Koracha;" his cheating habit in "To cheat like a Korava" and his palpable injustice in "The Koracha's justice is the ruin of the family." The poverty of the mendicant Jogi is neatly hit off in "When Jogi and Jogi clasp, both are smeared with ashes" and no more, for, there is nothing to rob, and his means of livelihood in "The Jogi's knapsack is on his shoulder the moment he gets up." That agriculture and the Holeya are widely apart is referred to in "Never engage in agriculture depending on the word of a Holeya." That the Madiga is no *persona grata* with any one is clear from "No truth in Vedas and no Madiga in Heaven."

Brief Descriptions of Main Castes and Tribes.

General.

The brief descriptions of the main castes and tribes found in the State given below are based primarily on the late Mr. Nanjundayya's monographs on them. Those interested in the subject should refer to them for further particulars. The Glossaries of castes included in the Madras and Mysore Census Reports for 1901 and the Mysore Census Report for 1911 and Mr. Thurston's *Castes*

Tribes of Southern India may also be advantageously consulted by them. Some useful information will also be found in the Madras and Mysore Census Reports for 1891.

Banajiga (1,35,000).

Banajiga.—Kannada and Telugu Tradesman. The term Banajiga is derived from Vanik, Vanijya, trader. Only a sixteenth part of the caste, however, engage in trade, the rest being agriculturists. The two main divisions are Panchama (or Lingayat) and Telugu, who do not intermarry or interdine. The Telugu is sub-divided into (1) Dasa, who are chiefly found in Channapatna and state that they are Jain converts to Vaishnavism; (2) Ele, or Tota, because they grew chiefly the betel vine; (3) Dudi, traders in cotton; (4) Gazula or Setti, bangle sellers; (5) Nayudu, or Kaata; (6) Ravut or Oppana, who profess to be the descendants of soldiers sent to the country during the days of the old Vijayanagar kings; Mannuta (also called, Dandi Dasaris) who are wandering hawkers and beggars, etc. Many Ele and Dasa Banajigas speak Kannada, while to the rest of the sub-divisions Telugu is the home language. Marriage is infant or adult, though usually the latter. Except among the Mannuta sub-division, widow remarriage is strictly forbidden. Divorce is not allowed. This caste is at the head of the Right Hand section of castes. The Headman is called Desada Setti and he occupies a very influential position in society. His insignia of office (the bell and ladle) is carried by the Chalavadi of the Holeya caste. The dead are buried. The Lingayat Banajigas practise infant marriage, prohibit widow marriage and interdict animal food and intoxicating drinks. They have Jangam Gurus. The usual caste titles are *Ayya*, *Anna*, *Setti*, and *Nayudu*.

Beda (2,71,000).

Beda.—They sometimes call themselves Palegars, because some of the old Palegar families belong to this caste, Gurikars (Marksmen) and Kiratas (Hunters). From the

fact that Valmiki, the famous author of the *Ramayana*, is described as a Beda, they also style themselves Valmiki. They claim, besides, that Kannappa Nayanar, one of the 63 devotees of Siva, belonged to their caste. The term Beda is derived from Vyadha which means Hunter. Hunting is the traditional occupation of the caste but most have taken to agriculture. Many of the caste were soldiers in the armies of the old Vijayanagar Kings and Hyder. Telugu was probably the original language of the caste but Kannada is now the language of those living in essentially Kannada Districts. The caste is divided into several endogamous divisions:—(1) Uru Bedas or Chinna Boyis; (2) Myasa Bedas or Pedda Boyis; (3) Ureme Bedas; (4) Monda Bedas, etc. The first of these live in villages; hence their name *Uru*. They form by far the largest division of the caste. The Myasa Bedas are mostly found in the Chitaldrug District. They practise circumcision and do not eat fowls and pigs. Until recently, they lived only in jungles. The Monda Bedas are the wandering section of the tribe and live entirely by begging from other castes. The various divisions are still further sub-divided into numerous exogamous septs, each named after a plant or an animal and sometimes an inanimate object. Most of them appear to be totems. Marriage is generally adult though infant marriage is not altogether unknown. The usual bride-price is Rs. 12. Widow re-marriage is allowed. Divorce is permitted. The dedication of daughters as *Basavis* for perpetuating the family is practised. The dead are usually buried. Members of the higher castes are admitted into the caste after a regular ceremony in the presence of castemen. *Illatom*, or the affiliation of the son-in-law, is sometimes resorted to in the caste. The usual title is *Nayak*.

Bestha. (1,58,000)

Bestha.—These form the fisher folk of the State. In the eastern districts, they are called Besthas; in the southern,

as Toraya, Ambiga and Parivara (Boatmen); and in the western, as Kahyara and Gangemakkalu. They speak Kannada. Though fishing is the traditional occupation, a great many follow lime-burning, palanquin-bearing and cultivation. These differences in occupation have become bars to inter-marriage among the sections following them. The name Bestha is derived from the Kannada word *baesad*, thrown, from the throwing of the net to catch fishes. The caste is divided into numerous exogamous septs, which appear to be totemistic in origin. Marriage is both infant and adult. Re-marriage of widows and divorce are allowed. The bride-price is Rs. 12. The practice of dedicating girls as *Basavis* is said to be getting into disfavour. The dead are usually buried. The usual titles are *Raju*, *Nayaka* and *Boyi*.

Brahman (2,16,000).

Brahman.—The traditional occupation of this caste is the study of the Veda, the offering of sacrifices and teaching. According to the early text-writers, only a Brahman learned in the Veda has a right to the prerogatives of his caste. One not versed in the Veda is, according to them, only a Brahman by birth. The *Bhagavad Gita* defines the true Brahman as one who is attached to the Brahman. A true Brahman is also described as a person who swerves not from the truth. Manu compares unworthy Brahmans to cats and herons (hypocrites). According to him, a Brahman cannot acquire money by sacrificing or teaching. The *Satapatha Brahmana* thus describes the four qualifications of a Brahman; Brahmanical descent, befitting deportment, fame and the perfecting of the people. Vishnu defines a Brahman as one who is benevolent towards all creatures. With the Buddhists, the Brahman was not *sacro sanct*. We have in the *Dhammapada* the following negative definition: 'A man does not become a Brahman by his plaited hair, by his family or by birth:

in whom there is truth and righteousness, he is blessed, he is a Brahman.' The *Sutta Nipada* describes three kinds of Brahmans : Titthiyas, Ajivakas and Niganthas. The *Buddhist Suttas* ascribe fanciful powers to the Brahmans. By intense meditation, they say they can cause an earthquake. In the *Questions of King Milinda*, we find Buddha calling himself a Brahman, *i.e.*, an Arhat. In the *Jaina Sutras*, likewise, Brahman is given as a title of Mahavira. The same *Sutras* hold that real Brahmanhood is to be found among those who are not attached to the world. This seems to be an echo of the Upanishads which proclaim, " Let a Brahman become a Muni and then he is a Brahman." For ages, however, Brahmans have lived the householder's life. The very descriptions of the Brahman given in the different texts show that slowly from a mere sacrificial priest, the Brahman developed into a layman. At present, Brahmans in this State, as elsewhere, are only to a limited extent followers of their traditional occupations. They are mostly landowners, officials in Government Service, and members in the learned professions. Their customs and habits are too well known to need special mention here. A few facts relating to the many divisions into which they are cut up, the different languages they speak, the various religions adhered to by them, however, merit attention. These will show that they are more a community than a caste and that they are no more homogeneous than other such communities are or can be.

The Brahmans are, according to their original location or language, divided into Pancha Gauda, *i.e.*, the five sections of the Gauda country, the country north .of the Vindhyas, and the Pancha Dravida, the country south of the Vindhyas. The Pancha Gauda include the following :—

(1) Kanya Kubja (United Provinces) ;
(2) Sarasvata (Punjab) ;
(3) Gauda (Delhi and Bengal)

(4) Maithila (Behar); and
(5) Utkala (Orissa).

The Pancha Dravida comprise the following :—

(1) Karnataka or Kannada;
(2) Andhra or Telugu;
(3) Dravida or Tamil;
(4) Maharashtra or Mahratta; and
(5) Gurjara or Guzerati.

While a few of the first three sections of the Pancha Gauda and of the fifth of the Pancha Dravida are found in the State, the bulk of the Brahmans in it belong to the first four sections of the Pancha Dravida.

Among these four, the first, the Karnataka preponderates, being more than the total of the other three. These seldom inter-marry and retain, despite the long interval that has elapsed since their immigration into the State and the vicissitudes they have passed through, their original languages. Brahmans generally are further sub-divided into a number of *Gotras*, the original progenitors of which were seven principal *Rishis* or sages. In the unlimited ramifications of *Gotras* which have branched out from the parent stems, the line of descent is exhibited in the *Pravara* pedigree and a man and woman of the same *gotra* and *pravara* never marry together. The connection of the *gotra* is entirely in the male line, a woman on marriage being affiliated to the husband's *gotra*. The following are the strongest *gotras* in Mysore containing over 7,000 in each :—

Bharadvaja	Gautama
Kasyapa	Jamadagni
Visvamitra	Angirasa
Vasishtha	Vadhula
Srivatsa	Sandilya
Atreya	Maudgalya
Kausika	Maunabhargava
Kaundinya	Gargyayana
Harita	Sathamarshana

Altogether sixty-nine *gotras* are represented here, the remainder, in alphabetical order, being—Achyuta, Agastya, Ambarisha, Asvalayana, Badarayana, Barhaspatya, Chopagayana, Devaraja, Dhananjaya, Galava, Gauda Sarasvata, Ghritasamsa, Havikarma, Kalakausika, Kamakayana, Kanva, Kapi, Katyayana, Kosala, Kundalai, Kutsa, Lohita, Maitreya, Mandavya, Maunjyayana, Mitravasu, Mohana, Nistudhana, Parasara, Parthiva, Paulastya, Paurakutsa, Putamansa, Rajendra, Rathitara, Salankayana, Salavatsa, Sankalika, Sankarshana, Sankhyayana, Sankriti, Santasa, Saunaka, Svantantrakapi, Upamanya, Vadhryasva, Vaikhanasa, Vaisampayana, Vamana, Vishnuvardhana and Vyasa.

In addition to the *gotra* there is the *sakha* or particular branch or school of the Veda which each man professes to follow in the performances of his sacrifices and rites. Classified on this basis, there are in the State, nearly as many Rig Vedis as there are Yajur and Sama Vedis together. There are none apparently who acknowledge adhesion to the Atharva Veda. They are also further divided into those who follow the Apastamba Sutra and those others who follow the Asvalayana Sutra. The latter seem to preponderate in the State.

The Brahmans in the State, moreover, belong to one of the three main sects:—Smartha, Madhva and Sri Vaishnava. The Smartas are more than twice the strength of the Madhvas and Sri Vaishnavas put together.

All these three sects are composed of either Vaidikas or Laukikas, the former, consisting of those who devote themselves entirely to religion and live partly on charity and partly on their earnings as priests; the latter, those who attend to temporal affairs. The distinction, however, is merely an individual one, as different members of the family may be either Vaidikas or Laukikas according to inclination.

The Smarthas derive their name from Smriti, the code of revealed or traditional law. They always worship the triad of Brahma, Siva and Vishnu under the mystic syllable OM, and while admitting them to be equal, exalt Siva as their chief deity. They hold the Pantheistic Vedanta doctrine of Advaita or non-dualism, believing God and matter to be identical and everything to be an atom of divinity, they themselves being parts of the Supreme Being. The founder of the Smartha Sect is Sankara or Sankaracharya, the Hindu reformer of the eighth century, and their Guru is the Sringeri Swami, designated the Jagad Guru. Probably the very ancient sect of the Bhagavata or the Bhagavata Sampradaya, are reckoned as Smarthas, but they incline more to Vishnu worship. The Guru of the Bhagavatas is at Talkad. The distinctive marks of a Smartha Brahman are three parallel horizontal lines of pounded sandalwood, or of the ashes of cowdung on the forehead, with a round red spot in the centre, but the Bhagavatas wear perpendicular Vaishnava marks.

The Madhvas are so called from Madhvacharya or Madhva, the founder of the sect, who arose in South Kanara in the 13th century. They worship both Vishnu and Siva, but more particularly the former. They profess the doctrine of Dwaita or dualism, considering the creator and the created to be distinct, and their final absorption to be in the future. It appears that they may be divided into the Vyasakuta and the Dasakuta. The former adhere strictly to the religious teachings of the founder, which are entirely in Sanskrit. The latter base their faith on the hymns and writings in the vernacular, which they can understand, of persons of their sect distinguished as Dasas or servants of God, and they go about with musical instruments singing these in honour of the Divine Being. A Madhva Brahman is known by a black perpendicular line from the junction